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NRCS

Natural
Resources
Conservation
Service

In cooperation with
Oklahoma
Agricultural
Experiment Station
and Oklahoma
Conservation
Commission

Soil Survey of Jackson County, Oklahoma



How To Use This Soil Survey

This survey includes general information about the survey area, descriptions of the detailed soil map units and soil series in the area, a description of how the soils in the area formed, and descriptions of the use and management of the soils and the major soil properties.

The descriptions of the **detailed soil map units**, when used in conjunction with the detailed soil maps, can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. The **Contents** and the **Bookmarks** in this survey list the map units by symbol and name. Also, the **Bookmarks** link to the page where each map unit is described.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See the **Contents** and the **Bookmarks** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in the period 1995 to 1999. Soil names and descriptions were approved in 1999. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1999. This survey was made cooperatively by the Natural Resources Conservation Service, the Oklahoma Agricultural Experiment Station, and the Oklahoma Conservation Commission. The survey is part of the technical assistance furnished to the Jackson County Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover: Concrete-lined irrigation ditch in an area of Roark loam, 0 to 1 percent slopes. Cotton is being grown on the left and grain sorghum on the right.

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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State Conservationist
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Soil Survey of Jackson County, Oklahoma

Fieldwork by Richard Gelnar, Clay Salisbury, and
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United States Department of Agriculture,
Natural Resources Conservation Service,
in cooperation with
Oklahoma Agricultural Experiment Station and Oklahoma
Conservation Commission

This soil survey updates the survey of Jackson County published in 1961 (USDA, 1961b). It provides additional information and has maps that show the soils in greater detail.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile (Soil Survey Staff, 1998 and 1999). After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Nature of the County

JACKSON COUNTY is in southwestern Oklahoma (fig. 1). It has an area of 523,149 acres, or nearly 820 square miles. Of this, water areas of more than 40 acres make up 23,499 acres. The county has a population of about 30,902 (1990 census). Altus, the county seat, is in central part of the county. In 1990, it had a population of 23,000.

Jackson County is bordered on the west by Harmon County, Oklahoma; on the north by Greer and Kiowa Counties, Oklahoma; on the east by Kiowa and Tillman Counties, Oklahoma; and on the south by Hardeman and Wilbarger Counties, Texas.

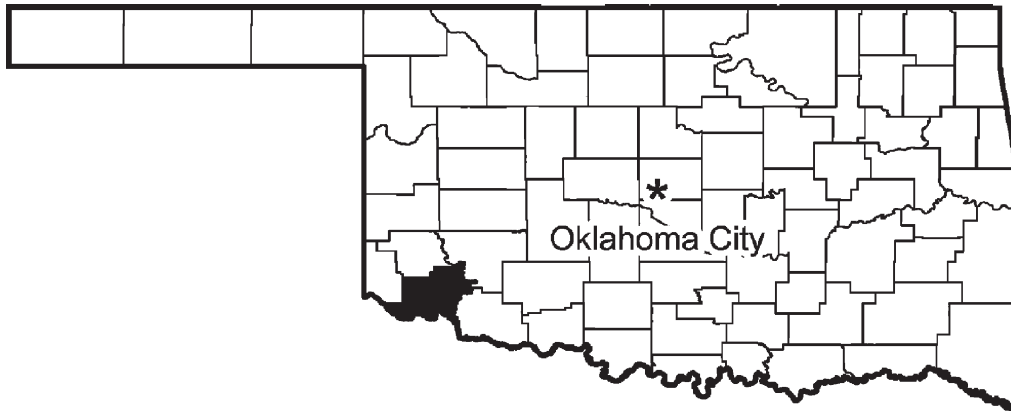


Figure 1.—Location of Jackson County in Oklahoma.

History

By Burna Cole, Museum of the Western Prairie, Altus, Oklahoma.

From the time of Coronado's exploration of the plains of Texas, the Oklahoma Panhandle, and western Kansas in 1542, the area of present-day Jackson County has been a matter of dispute between nations. Spain claimed the region as part of the "right of exploration," basing its claim on Coronado's expedition. France also laid claim to the region on the basis of a "right of exploration" when in 1673 Father Marquette and Louis Jolliet followed the course of the Mississippi River as far south as the Arkansas River and claimed the river and all its drainage area for France. Following the French and Indian War, France ceded its territory west of the Mississippi River to Spain. Napoleon negotiated for the return of the territory but then in 1803 sold the region as the Louisiana Purchase to the United States.

Always in dispute, first between the French and the Spanish, the boundaries became even more hotly contested when the more aggressive Americans became Spain's neighbors. France had told the United States that it would receive the boundaries just as France had received them from Spain. The area was bounded on the east by the Mississippi River, on the south by the Gulf of Mexico, and on the west by the Sabine River, the Red River, the Arkansas River, and the Continental Divide. The Red River was a problematic boundary. In spite of the fact that Pedro Vial had mapped the Red River to its headwaters in the Palo Duro Canyon in 1785, several expeditions by the United States intended to locate the headwaters failed. In 1852, Captain Randolph Marcy and Captain George McClellan finally secured an accurate mapping of the river for the United States, but they did not accurately locate the 100th meridian at that time. The United States considered the most southern and westerly flowing branch, known as the Prairie Dog branch, the boundary with Mexico. Mexico and later the Republic of Texas regarded the North Fork of the Red River as the principal riverbed and therefore the boundary. Texas proceeded to organize a county and named it "Greer" after John Greer, Lt. Governor of Texas.

Following the Civil War, John Lytle opened the Great Western Cattle Trail through the region. The trail was in use from 1874 until about 1888. An average of 300,000 head of cattle moved over the trail annually, along with approximately 7,000 horses and 1,000 men.

When President Harrison signed the Organic Act, which authorized the organization of Oklahoma Territory in 1890, he directed that suit be brought against

Texas in the United States Supreme Court to settle once and for all the question of boundary and jurisdiction. In 1896, the Supreme Court found in favor of the United States and against Texas. A region having 1.4 million acres of land was added to the Oklahoma Territory. At statehood in 1907, Jackson County separated from Old Greer and Altus was selected as county seat by popular vote.

Settlement of Old Greer and therefore Jackson County occurred primarily through emigration by Texans into the region. Cattle ranches, such as the Cross-S (owned by the Eddleman brothers), Ikard-Harold Cattle, and Franklin Cattle, ran their livestock on the open plains. Meanwhile, nesters (squatters, sodbusters, and farmers) drifted into the area looking for a better future. Texas offered land to veterans of the Texas War of Independence from Mexico in 1836. One recipient of such a grant was Captain A.S. Mangum, for whom the town of Mangum is named. Once the land became a part of the Oklahoma Territory, the United States Government allowed those in residence to file on 160-acre homesteads and gave them the option to purchase an additional 160 acres.

Hampered by an insufficient water supply, the people of Jackson County were constantly endeavoring to find and establish a reliable source of potable water. An irrigation system developed by W.J. Fullerton in 1898 proved that it was possible to capture water with dams and through proper management reap substantial profits. Unfortunately, Mr. Fullerton was unable to obtain adequate capital to rebuild this irrigation project after a natural disaster destroyed the dam. The problem of insufficient water persisted. In 1927, Altus constructed a small dam across the North Fork of the Red River and laid a redwood pipeline to the city. Along the way, farmers tapped into the line to irrigate crops. This arrangement proved so successful that a group of businessmen lead by W.C. Austin began to plan and lobby for a higher dam and an irrigation district. The Bureau of Reclamation began work on the dam in 1942. The new dam and irrigation district were dedicated in 1947. Water has made it possible for Jackson County to lead Texas in cotton production.

Because of the demand for additional water for industrial needs, the Mountain Park Project developed Tom Steed Lake east of Altus. Water is diverted via a 10.8-mile canal from Elk Creek to Otter Creek. Each day, 10 million gallons of water is pumped to Altus, 3.5 million gallons to Frederick, and 760,000 gallons to Snyder.

Although primarily an agricultural community, Altus has recognized the need for diversification. In 1953, efforts to attract industry resulted in the reopening of the old Altus Air Force Field, which became Altus Air Force Base. In recent years, the county has attracted many nonagricultural industries, including a processor and distributor of meat products and a producer of weight-lifting and health equipment.

Physiography, Relief, and Drainage

Jackson County has two major land resource areas within its boundaries. The western third of the county is in the Central Rolling Red Plains, Western Part (78B). The rest of the county is in the Central Rolling Red Plains, Eastern Part (78C).

Elevation ranges from approximately 1,190 to 1,710 feet. The highest point is in the northeastern part of the county, between Blair and Warren. The lowest point is at the confluence of the North Fork of the Red River and the Red River, in the southeast corner of the county.

Jackson County has four basic topographic areas. The first of these consists of the eastern and central parts of the county, which are characterized by broad, nearly level to gently sloping alluvial terraces consisting of fine textured and moderately fine textured soils. These soils are very productive and generally are cultivated.

The second topographic area is the western part of the county, which is characterized by nearly level to moderately sloping hills formed from the interbedded

gypsum, dolomite, and claystone of the Blaine Formation of Permian age. This area has the typical karst topography that forms in areas of gypsum or limestone bedrock. It has numerous sinkholes and few drainageways to streams or rivers. Most of the soils formed in material weathered from the Permian bedrock or in local alluvium. The soils are very shallow to very deep over bedrock. They are moderately productive but are susceptible to erosion when cultivated. Many acres in this area have been reseeded to native grass or tame pasture species.

The third topographic area is west-central part of the county, which generally runs in a line from north to south. This area is characterized by steep escarpments, rolling hills, and badlands. It is a transitional zone from the rolling uplands in the west to the broad, flat terraces in the east. The soils generally are clayey and are shallow to very deep over bedrock. They are characterized by low or moderate productivity and are susceptible to erosion when cultivated.

The fourth topographic area occurs in the northeastern and the far southwestern parts of the county. This area is characterized by gently sloping to steep sand dunes and very gently sloping alluvial terraces. It has mainly very deep, loamy or sandy soils that formed in alluvial or windblown sediments and have low to moderately high productivity.

The entire county is in the Red River Basin. The general drainage pattern is from northwest to southeast in the western part of the county and from north to south in the eastern part. The county has three major rivers and several smaller streams. The Red River is the southern boundary of the county. The North Fork of the Red River is the eastern boundary. It flows into the Red River at the southeast corner of the county. The Salt Fork of the Red River flows from north to south through the central part of the county. It flows into the Red River. Several smaller tributaries flow into the larger rivers. Sand Creek, Gypsum Creek, and Turkey Creek drain most of the county west of the Salt Fork of the Red River. Bitter Creek and Stinking Creek drain most of the county east of the Salt Fork of the Red River.

Irrigation

Irrigation has become an important factor in the production of agricultural crops in Jackson County. Approximately 70,000 acres in the county is irrigated. Cotton is the main irrigated crop. Alfalfa, grain sorghum, and peanuts also are irrigated.

Water for irrigation in the county comes mainly from three sources. Lake Altus is the largest source. It has a system of canals managed by the Lugert-Altus Irrigation District. The lake supplies water to approximately 46,000 acres between the Salt and North Forks of the Red River.

Wells supply water for irrigation from two different underground aquifers. One aquifer is in the western part of the county. It consists of water-filled gypsum cavities and solution channels in the Blaine Formation. This water is high in content of dissolved minerals, mostly gypsum, and is not suitable for consumption by humans or livestock. It has been used since the early 1950s with few problems. Because of its salt content, however, it should be tested regularly.

The other aquifer that supplies irrigation water is in deposits of sand and gravel along some of the major streams and rivers in the county. Generally, this aquifer is shallower than the other underground aquifer in the county and supplies water of high enough quality for consumption by humans and livestock.

Nearly all water from the Lugert-Altus Irrigation District is applied by canals and furrows. Well water is applied by both furrows and sprinkler systems. The number of center-pivot sprinkler systems has been increasing because these systems require less labor and are more efficient than other systems.

Climate

Prepared by the National Water and Climate Center, Natural Resources Conservation Service, Portland, Oregon.

The table "Temperature and Precipitation" gives climatic data for the survey area as recorded at Altus in the period 1961 to 1990. The table "Freeze Dates in Spring and Fall" shows probable dates of the first freeze in fall and the last freeze in spring. The table "Growing Season" provides data on the length of the growing season.

In winter, the average temperature is 41.5 degrees F and the average daily minimum temperature is 27.9 degrees. The lowest temperature on record, which occurred at Altus on December 23, 1989, is -10 degrees. In summer, the average temperature is 82.3 degrees and the average daily maximum temperature is 95.8 degrees. The highest temperature, which occurred at Altus on June 27, 1994, is 115 degrees.

Growing degree days are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual precipitation is 25.32 inches. Of this, 19.66 inches, or about 78 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 7.10 inches at Altus on October 20, 1983. Thunderstorms occur on about 48 days each year, and most occur between April and August, with more than 9, on average, in May alone.

The average seasonal snowfall is 3.5 inches. The greatest snow depth at any one time during the period of record was 9 inches. It occurred on January 7, 1973. On the average, 1 day per year has at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record is 7.0 inches. It occurred on January 7, 1973.

The average relative humidity in midafternoon is about 50 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 78 percent of the time possible in summer and 66 percent in winter. The prevailing wind is from the south or southwest in all months, except for January and February, when it is from the north. Average windspeed is highest, about 14 miles per hour, in March and April.

Soil Survey of Jackson County, Oklahoma

Temperature and Precipitation

(Recorded in the period 1961-90 at Altus Oklahoma)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
	<i>°F</i>	<i>°F</i>	<i>°F</i>	<i>°F</i>	<i>°F</i>	<i>Units</i>	<i>In</i>	<i>In</i>	<i>In</i>		<i>In</i>
January-----	52.7	25.5	39.1	80	0	19	0.84	0.14	1.59	1	1.5
February----	58.0	29.7	43.9	84	6	48	1.10	0.34	1.79	2	1.4
March-----	68.3	38.4	53.4	93	15	183	1.56	0.55	2.49	3	0.0
April-----	77.9	48.3	63.1	97	27	400	1.92	0.79	2.99	3	0.0
May-----	85.2	57.6	71.4	102	39	662	4.23	1.66	6.38	5	0.0
June-----	93.0	66.4	79.7	107	52	891	3.51	1.65	5.12	4	0.0
July-----	98.1	70.8	84.4	109	59	1,060	1.72	0.50	2.81	3	0.0
August-----	96.3	69.0	82.7	108	56	1,013	2.48	0.62	3.95	3	0.0
September---	87.8	62.1	74.9	103	40	749	3.43	1.01	5.38	4	0.0
October-----	78.4	50.2	64.3	97	29	450	2.37	0.62	3.77	3	0.0
November----	64.9	38.7	51.8	86	18	141	1.31	0.43	2.20	3	0.2
December----	54.3	28.6	41.5	77	6	24	0.85	0.27	1.38	2	0.4
Yearly:											
Average---	76.3	48.8	62.5	---	---	---	---	---	---	---	---
Extreme---	115	-10	---	110	-3	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,640	25.32	19.20	30.46	36	3.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Soil Survey of Jackson County, Oklahoma

Freeze Dates in Spring and Fall

(Recorded in the period 1961-1990 at Altus, Oklahoma)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than-----	March 31	April 9	April 13
2 years in 10 later than-----	March 24	April 5	April 9
5 years in 10 later than-----	March 10	March 27	April 1
First freezing temperature in fall:			
1 year in 10 earlier than---	Nov. 6	Oct. 21	Oct. 15
2 years in 10 earlier than---	Nov. 13	Oct. 29	Oct. 21
5 years in 10 earlier than---	Nov. 25	Nov. 12	Nov. 2

Growing Season

(Recorded in the period 1961-1990 at Altus,
Oklahoma)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	<i>Days</i>	<i>Days</i>	<i>Days</i>
9 years in 10	233	204	193
8 years in 10	242	213	201
5 years in 10	259	231	214
2 years in 10	276	248	228
1 year in 10	285	257	235

Formation of the Soils

Five major factors affected formation of the soils in Jackson County. These are climate, living organisms, topography, parent material, and time.

Climate

Jackson County has a dry subhumid climate. The climate is fairly uniform throughout the county. The amount of rainfall increases slightly from west to east across the county, but differences among soils cannot be attributed to differences in the present climatic conditions. Moisture and warm temperatures have been sufficient to promote the formation of distinct layers in many of the soils. The extent of soil leaching is low or moderate. The physical abrasion and redistribution of materials by the wind affect soil formation in the county.

Living Organisms

Plants, burrowing animals, insects, and micro-organisms in the soil have a direct influence on soil formation. Native grasses and trees have different effects on the losses and gains of organic matter and plant nutrients and on soil structure and porosity. Soils that formed under prairie vegetation have a dark grayish brown surface layer and a moderately high content of organic matter. Soils that formed under trees have a brown surface layer and a low content of organic matter.

Topography

Relief influences soil formation mainly through its effect on water movement, erosion, soil temperature, and the kind of plant cover. Relief in Jackson County is determined largely by the resistance of underlying formations to weathering and geologic erosion. The western part of the county has gently rolling uplands with very gently sloping to moderately sloping hills. The soils on the summits and shoulders of hills are generally very shallow to moderately deep over bedrock. The soils on side slopes and footslopes are generally deep or very deep over bedrock. The eastern part of the county has nearly level or very gently sloping terraces and some low hills. The soils are generally very deep over bedrock, except for those on the summits and shoulders of hills, which are moderately deep or deep over bedrock. A transitional zone between these areas is characterized by steep rock escarpments and badlands.

Parent Material

Soils form in unconsolidated material that influences the rate of formation and the chemical, physical, and mineralogical composition of the soil. This material may be weathered directly from the bedrock or transported and deposited by water or wind. It affects color, texture, fertility, and other characteristics of the soil.

The soils on uplands, which are mostly in the western part of the county, formed in material weathered from claystone, shale, dolomite, gypsum, and a few outcrops of

sandstone. The soils on the extensive terraces in the eastern part of the county formed in alluvial sediment, which was deposited by water. The kind of sediment deposited and the kinds of soil that formed in it depend largely on the source of the sediment and the velocity of the streams.

Time

As a factor in soil formation, time is difficult to measure strictly in years. The length of time needed for the development of genetic soil horizons depends on the intensity and interactions of the other soil-forming factors in promoting the losses, gains, transfers, or transformations of the constituents necessary in horizon development. Soils that do not have definite genetic horizons are young or immature. Mature or older soils have approached equilibrium with their environment and tend to have well defined horizons.

The soils in Jackson County range from young to old. Hollister, La Casa, and Tillman soils are examples of old soils. Devol, Grandfield, and Tipton soils are younger, but they have well expressed horizons. Gracemont and Lincoln soils are examples of young soils that formed in recent sediments on flood plains and show little evidence of horizon development.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustalf (*Ust*, meaning burnt, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplustalfs (*Hapl*, meaning minimal horizonation, plus *ustalf*, the suborder of the Alfisols that has an ustic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplustalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, thermic Typic Haplustalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

The table "Classification of the Soils" indicates the order, suborder, great group, subgroup, and family of the soil series in the survey area.

Soil Survey of Jackson County, Oklahoma

Classification of the Soils

Soil name	Family or higher taxonomic class
Acme-----	Fine-silty, mixed, active, thermic Gypsic Calciustolls
Arnett-----	Fine-loamy, mixed, active, thermic Typic Haplustalfs
Aspermont-----	Fine-silty, mixed, active, thermic Typic Calciustepts
Beckman-----	Fine, mixed, active, calcareous, thermic Vertic Ustifluvents
Brico-----	Clayey-skeletal, mixed, active, thermic Typic Argiustolls
Burford-----	Fine-silty, mixed, superactive, thermic Typic Haplustepts
Cobb-----	Fine-loamy, mixed, active, thermic Typic Haplustalfs
Cottonwood-----	Loamy, mixed, superactive, calcareous, thermic, Lithic Ustorthents
Decobb-----	Fine-loamy, mixed, active, thermic Typic Haplustalfs
Devol-----	Coarse-loamy, mixed, superactive, thermic Typic Haplustalfs
Eastall-----	Fine, smectitic, thermic Ustic Epiaquerts
Eda-----	Mixed, thermic Lamellic Ustipsamments
Ezell-----	Sandy, mixed, thermic Aeric Fluvaquents
Farry-----	Fine-loamy, mixed, superactive, thermic Typic Argiustolls
Frankirk-----	Fine, mixed, superactive, thermic Typic Argiustolls
Gracemont-----	Coarse-loamy, mixed, superactive, calcareous, thermic Oxyaquic Udifluvents
Gracemore-----	Sandy, mixed, thermic Oxyaquic Udifluvents
Grandfield-----	Fine-loamy, mixed, superactive, thermic Typic Haplustalfs
Grandmore-----	Fine-loamy, mixed, active, thermic Typic Haplustalfs
Hardeman-----	Coarse-loamy, mixed, superactive, thermic Typic Haplustepts
Harmon-----	Loamy-skeletal, carbonatic, thermic, shallow Typic Ustorthents
Headrick-----	Fine-loamy, mixed, active, thermic Oxyaquic Haplustalfs
Heatly-----	Loamy, mixed, active, thermic Arenic Paleustalfs
Hollister-----	Fine, smectitic, thermic Typic Haplusterts
Jester-----	Mixed, thermic Typic Ustipsamments
Knoco-----	Clayey, mixed, active, calcareous, thermic, shallow Aridic Ustorthents
La Casa-----	Fine, mixed, superactive, thermic Typic Argiustolls
Lincoln-----	Sandy, mixed, thermic Typic Ustifluvents
Madge-----	Fine-loamy, mixed, superactive, thermic Typic Argiustolls
Mangum-----	Fine, mixed, active, thermic Vertic Haplustepts
Nipsum-----	Fine, mixed, superactive, thermic Cumulic Haplustolls
Oakley-----	Fine-loamy, mixed, active, thermic Typic Calciustolls
Ozark-----	Fine-loamy, mixed, active, thermic Typic Argiustolls
Roark-----	Fine, mixed, superactive, thermic Pachic Argiustolls
Rups-----	Fine-silty, mixed, superactive, thermic Oxyaquic Haplustolls
Spikebox-----	Loamy, mixed, active, thermic, shallow Typic Haplustepts
Springer-----	Coarse-loamy, mixed, superactive, thermic Typic Paleustalfs
Spur-----	Fine-loamy, mixed, superactive, thermic Fluventic Haplustolls
Talpa-----	Loamy, mixed, superactive, thermic Lithic Calciustolls
Tillman-----	Fine, mixed, superactive, thermic Vertic Paleustolls
Tilvern-----	Fine, mixed, active, thermic Vertic Haplustepts
Tipton-----	Fine-loamy, mixed, superactive, thermic Pachic Argiustolls
Treadway-----	Fine, mixed, active, thermic Typic Haplustepts
Ustorthents-----	Mixed, active, thermic Ustorthents
Vernon-----	Fine, mixed, active, thermic Typic Haplustepts
Vinson-----	Fine-silty, mixed, superactive, thermic Entic Haplustolls
Westill-----	Fine, mixed, active, thermic Vertic Argiustolls
Westola-----	Coarse-loamy, mixed, superactive, calcareous, thermic Typic Ustifluvents
Woods-----	Fine, smectitic, thermic Typic Calciusterts

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993) and in the "Field Book for Describing and Sampling Soils" (Schoeneberger and others, 2002). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998).

Unless otherwise indicated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

Acme Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy alluvium or lacustrine sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces

Position: Treads

Slope: 0 to 3 percent

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 40

Taxonomic classification: Fine-silty, mixed, active, thermic Gypsic Calciustolls

Associated Soils

These are soils of the Abilene, Aspermont, Grandfield, Roark, and Tipton series. These soils do not have a gypsic horizon. Aspermont soils do not have a mollic epipedon, have Permian red-bed sediments within a depth of 60 inches, and occur on the higher side slopes. Grandfield soils do not have a mollic epipedon, have an argillic horizon, and occur on the higher side slopes. Abilene, Roark, and Tipton soils have a mollic epipedon that is more than 20 inches thick, have an argillic horizon, and occur in landscape positions similar to those of the Acme soils or on the slightly higher slopes.

Typical Pedon

Acme silt loam, on a slope of 0.2 percent in an area of cropland; Childress County, Texas; from intersection of Farm Road 2530 and U.S. Highway 287 in Childress, 1.2 miles north on Farm Road 2530, about 5.8 miles east on Farm Road 268, about 1,250 feet south on a county road, and 80 feet east in cropland; latitude—34 degrees, 25 minutes, 57.8 seconds N.; longitude—100 degrees, 5 minutes, 21.8 seconds W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 6 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, very friable; common very fine and fine and few medium roots; many very fine and fine and few medium pores; 1 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline; clear smooth boundary. (6 to 18 inches thick)

Bw1—6 to 12 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, very friable; common very fine and fine and few medium roots; many very fine and fine and few medium pores; very few fine, rounded siliceous pebbles; 6 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear smooth boundary. (6 to 23 inches thick)

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- Bw2—12 to 19 inches; brown (10YR 4/3) silty clay loam, dark brown (10YR 3/3) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, very friable; common very fine and fine and few medium roots; many very fine and fine and few medium pores; very few fine, rounded siliceous pebbles; few fine threads of gypsum and calcium carbonate; 10 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual smooth boundary. (0 to 12 inches thick)
- Bk—19 to 32 inches; light brown (7.5YR 6/4) silty clay loam, brown (7.5YR 4/3) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, very friable; common very fine and fine and few medium roots; many very fine and fine and few medium pores; few fine, rounded siliceous pebbles; about 3 percent masses of calcium carbonate; about 1 percent fine and medium masses and threads of gypsum; 19 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; abrupt smooth boundary. (0 to 26 inches thick)
- Bky1—32 to 39 inches; 50 percent reddish brown (5YR 5/4) (moist) and 50 percent strong brown (7.5YR 5/6) (moist) gypsiferous silt loam; weak coarse prismatic structure; very hard, friable; few fine, rounded siliceous pebbles; about 70 percent visible crystals of gypsum; 43 percent gypsum, by weight; 16 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bky2—39 to 65 inches; reddish brown (5YR 4/4) (moist) gypsiferous silt loam; weak extremely coarse prismatic structure; very hard, friable; few fine, rounded siliceous pebbles; prism faces coated with 4-millimeter-thick calcium carbonate and gypsum flows; about 40 percent visible masses and crystals of gypsum; 41 percent gypsum, by weight; 18 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; diffuse smooth boundary.
- Bky3—65 to 80 inches; about 50 percent reddish brown (2.5YR 5/3) (moist) and 40 percent yellowish red (5YR 4/6) (moist) gypsiferous clay loam; weak extremely coarse prismatic structure; very hard, friable; reddish brown (2.5YR 4/4) strata and seams; prism faces coated with 2-millimeter-thick calcium carbonate and gypsum flows; about 35 percent visible gypsum crystals; 40 percent gypsum, by weight; 10 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline. (Combined thickness of the Bky horizons ranging from 20 to 60 inches)

Range in Characteristics

Thickness of the solum: More than 60 inches

Thickness of the mollic epipedon: 7 to 20 inches

Depth to secondary calcium carbonates: 0 to 7 inches

Depth to a gypsic horizon: 10 to 40 inches

Depth to Cr material: More than 80 inches

Depth to endosaturation: 4 to 6 feet during years of above average rainfall

Particle-size control section (weighted average):

Clay content—18 to 30 percent

Sand content—10 to 30 percent (less than 15 percent fine sand or coarser sand)

A horizon:

Color—hue of 7.5YR to 10YR, value of 4 or 5 (3 moist), and chroma of 2 or 3

Texture—loam, silt loam, silty clay loam, or clay loam

Clay content—12 to 30 percent

Calcium carbonate equivalent—1 to 5 percent

Electrical conductivity (EC)—dS/m of 0 to 4

Gypsum content—0 to 2 percent

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Sodium adsorption ratio (SAR)—0 to 4
Effervescence—very slightly effervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Bw horizon (where present):

Color—hue of 5YR to 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 4
Texture—loam, silt loam, silty clay loam, or clay loam
Clay content—18 to 30 percent
Calcium carbonate equivalent—1 to 10 percent
Electrical conductivity (EC)—dS/m of 2 to 4
Gypsum content—0 to 3 percent
Sodium adsorption ratio (SAR)—0 to 4
Effervescence—slightly effervescent or strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Bk horizon (where present):

Color—hue of 5YR to 10YR, value of 4 to 8 (3 to 6 moist), and chroma of 2 to 4
Texture—loam, silt loam, silty clay loam, or clay loam
Clay content—18 to 35 percent
Calcium carbonate equivalent—5 to 20 percent
Visible secondary carbonates—1 to 10 percent fine or medium threads, films, or masses
Electrical conductivity (EC)—dS/m of 1 to 4
Gypsum content—1 to 10 percent
Sodium adsorption ratio (SAR)—0 to 4
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

Bky horizon:

Color—hue of 2.5YR to 10YR, value of 5 to 8 (4 to 7 moist), and chroma of 1 to 8
Texture—gypsiferous forms of loam, silt loam, clay loam, or sandy loam with strata and pockets of loamy material
Clay content—12 to 35 percent
Calcium carbonate equivalent—5 to 20 percent
Visible secondary carbonates—0 to 5 percent fine or medium threads, films, or masses
Electrical conductivity (EC)—dS/m of 1 to 4
Gypsum content—weighted average of 40 to 80 percent, including as much as 20 percent fine selenite crystals; strata and concentrations varying in gypsum content with depth
Sodium adsorption ratio (SAR)—0 to 4
Effervescence—very slightly effervescent to strongly effervescent
Reaction—neutral to moderately alkaline

BC or C horizon (where present):

Color—hue of 2.5YR to 10YR, value of 5 to 8 (4 to 7 moist), and chroma of 1 to 8
Texture—strata or concentrations of gypsiferous forms of loam, clay loam, silty clay loam, or sandy loam
Clay content—12 to 35 percent
Calcium carbonate equivalent—1 to 15 percent
Visible secondary carbonates—0 to 5 percent fine or medium threads, films, or masses
Electrical conductivity (EC)—dS/m of 1 to 4
Gypsum content—weighted average of 3 to 50 percent; varying gypsum content in strata and concentrations
Sodium adsorption ratio (SAR)—0 to 4

Effervescence—very slightly effervescent to strongly effervescent
Reaction—neutral to moderately alkaline

Arnett Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy and gravelly alluvium of mid-Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces

Position: Interfluves and side slopes

Slope: 1 to 12 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, active, thermic Typic Haplustalfs

Associated Soils

These are soils of the Aspermont, Hardeman, Farry, Frankirk, Tilvern, and Vernon series. These soils contain less gravel in the solum than the Arnett soils. Aspermont soils have a fine-silty particle-size control section and are in the lower landscape positions. Hardeman soils have a coarse-loamy particle-size control section and are on recent terraces on the lower part of the landscape. Farry and Frankirk soils have a mollic epipedon. They are in landscape positions similar to those of the Arnett soils or are in slightly lower landscape positions. Tilvern and Vernon soils have a fine textured particle-size control section and are underlain by a Cd horizon of weathered shale. They are in the lower nearby dissected landscape positions.

Typical Pedon

Arnett sandy loam (fig. 2), on a slope of 3 percent in an area of pasture; Jackson County, Oklahoma; from the intersection of Oklahoma State Highways 5 and 6 in Eldorado, 2.4 miles southwest along State Highway 6, about 0.85 mile north along a county road, and 250 feet west in pasture; 850 feet south and 250 feet west of the northeast corner of sec. 22, T. 1 S., R. 24 W.; latitude—34 degrees, 27 minutes, 44 seconds N.; longitude—99 degrees, 41 minutes, 30 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 7 inches; brown (7.5YR 4/4) sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium granular structure; hard, friable; many very fine and fine and few medium roots; common very fine and fine and few medium pores; 7 percent, by volume, rounded quartzite gravel; gravel covering 40 percent of the surface; noneffervescent; neutral; abrupt smooth boundary. (4 to 13 inches thick)
- Bt1—7 to 11 inches; reddish brown (2.5YR 4/4) clay loam, dark reddish brown (2.5YR 3/4) moist; strong medium and coarse prismatic structure parting to strong medium subangular blocky; very hard, firm; common very fine and fine roots; common very fine and fine and few medium pores; many prominent clay films on faces of pedis; 3 percent, by volume, rounded quartzite gravel; noneffervescent; moderately alkaline; clear smooth boundary.

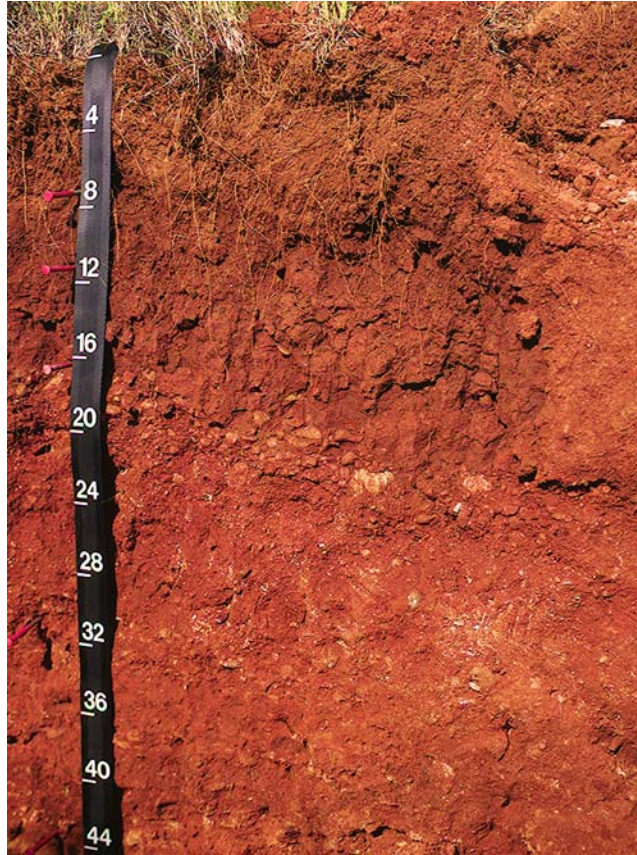


Figure 2.—Profile of Arnett sandy loam. Gravelly layers are below a depth of about 17 inches.

- Bt2—11 to 17 inches; reddish brown (2.5YR 5/4) clay loam, reddish brown (2.5YR 4/4) moist; strong medium and coarse prismatic structure parting to strong medium subangular blocky; very hard, firm; common very fine and fine roots; common very fine and fine and few medium pores; many prominent clay films on faces of peds; 5 percent, by volume, rounded quartzite gravel; noneffervescent; moderately alkaline; abrupt wavy boundary. (Combined thickness of the Bt horizons ranging from 8 to 40 inches)
- 2Bt3—17 to 31 inches; red (2.5YR 5/6) gravelly sandy clay loam, red (2.5YR 4/6) moist; moderate coarse prismatic structure; hard, friable; common very fine and fine roots; many very fine and fine and common medium and coarse pores; common distinct clay films on faces of peds; 34 percent, by volume, rounded quartzite gravel; very slightly effervescent; moderately alkaline; gradual wavy boundary. (10 to 30 inches thick)
- 2BC—31 to 43 inches; red (2.5YR 5/8) gravelly coarse sandy loam, red (2.5YR 4/8) moist; moderate coarse prismatic structure; hard, friable; common very fine and fine roots; many very fine and fine and common medium and coarse pores; 25 percent, by volume, rounded quartzite gravel; slightly effervescent; moderately alkaline; clear wavy boundary. (5 to 20 inches thick)
- 2Ck—43 to 57 inches; yellowish red (5YR 5/6) very gravelly coarse sandy loam stratified with sandy clay loam; yellowish red (5YR 4/6) moist; massive; few fine roots; few fine pores; 23 percent, by volume, rounded quartzite gravel and 1 percent angular conglomerate cobbles; few films and common fine concretions of

calcium carbonate in seams that are wavy and discontinuous; strongly effervescent; moderately alkaline; clear wavy boundary. (0 to 25 inches thick)
3Ck—57 to 84 inches; 70 percent reddish brown (2.5YR 5/4) and 30 percent reddish yellow (5YR 6/6) strata of clay, sandy clay loam, and very fine sandy loam 2 to 6 inches thick, 70 percent reddish brown (2.5YR 4/4) and 30 percent yellowish red (5YR 5/6) moist; massive; few fine roots; few fine pores; 6 percent, by volume, rounded quartzite gravel; few films and common fine and medium concretions of calcium carbonate in seams that are wavy and discontinuous; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches

Depth to secondary calcium carbonates: 10 to 50 inches

Calcium carbonate equivalent: 5 to 15 percent

Rock fragments: Dominantly gravel but ranging to stones in some pedons; consisting mainly of rounded quartzite but including conglomerate and granite fragments in some pedons

A horizon:

Color—hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 or 4; horizon thickness of less than 10 inches where value is 4 (3 moist) and chroma is 3

Texture—sandy loam, loam, or coarse sandy loam

Reaction—slightly acid to slightly alkaline

Content of rock fragments, by volume—5 to 15 percent rounded gravel less than 3 inches in diameter

Bt or Btk horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 6

Texture—sandy clay loam or clay loam

Reaction—neutral to moderately alkaline

Effervescence—noneffervescent to strongly effervescent

Content of rock fragments, by volume—5 to 15 percent rounded gravel less than 3 inches in diameter

2Bt or 2Btk horizon (where present):

Color—hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 6

Texture—gravelly sandy clay loam or gravelly clay loam

Reaction—neutral to moderately alkaline

Effervescence—noneffervescent to strongly effervescent

Content of rock fragments, by volume—15 to 35 percent rounded gravel less than 3 inches in diameter

2BC or 2BCK horizon (where present):

Color—hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8

Texture—sandy clay loam, clay loam, sandy loam, or the gravelly analogs of these textures

Reaction—slightly alkaline or moderately alkaline

Effervescence—slightly effervescent to violently effervescent

Content of rock fragments, by volume—5 to 30 percent rounded gravel less than 3 inches in diameter

2C or 2Ck horizon (where present):

Color—hue of 2.5YR to 7.5YR and value and chroma of 4 to 8

Texture—strata ranging from loamy coarse sand to gravelly clay loam

Reaction—moderately alkaline

Effervescence—slightly effervescent to violently effervescent

Clay content—5 to 30 percent

Content of rock fragments, by volume—1 to 35 percent rounded gravel less than 3 inches in diameter

3C or 3Ck horizon (where present):

Color—hue of 2.5YR to 7.5YR and value and chroma of 4 to 8

Texture—strata ranging from loamy coarse sand to clay in the fine-earth fraction

Reaction—moderately alkaline

Effervescence—slightly effervescent to violently effervescent

Content of rock fragments, by volume—1 to 15 percent rounded gravel less than 3 inches in diameter

Some pedons have a densic layer of weathered, Permian-age redbed sediments with texture of clay or clay loam below a depth of 60 inches. This layer may have stones or boulder-size fragments of conglomerate.

Aspermont Series

Major land resource area: Central Rolling Red Plains, Western Part (78B)

Depth class: Deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, silty colluvium over red-bed siltstone and claystone of the Blaine Formation of Permian age (fig. 3)

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Karstland

Landform: Hills

Position: Interfluves and side slopes

Slope: 1 to 25 percent

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 40

Taxonomic classification: Fine-silty, mixed, active, thermic Typic Calcicustepts

Associated Soils

These are soils of the Cottonwood, La Casa, Quanah, Talpa, Vernon, and Westill series. Cottonwood and Talpa soils occur in the higher landscape positions and are less than 20 inches deep to gypsum and limestone, respectively. La Casa and Westill soils occur in the lower landscape positions, have a mollic epipedon, and are fine textured in the particle-size control section. Quanah soils occur in the lower landscape positions and have a mollic epipedon. Vernon soils are in landscape positions similar to those of the Aspermont soils, are less than 40 inches deep to red-bed claystone sediments, and are fine textured in the particle-size control section.

Typical Pedon

Aspermont clay loam, on a slope of 1 percent in an area of rangeland; Stonewall County, Texas; from the junction of U.S. Highway 83 and Farm Road 2211 in Aspermont, 1.9 miles south on U.S. Highway 83 and 300 feet west in rangeland; latitude—33 degrees, 6 minutes, 23.55 seconds N.; longitude—100 degrees, 13 minutes, 25.93 seconds W.

(Colors are for dry soil unless otherwise indicated.)

A—0 to 6 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate fine and medium subangular blocky structure; hard, very friable;

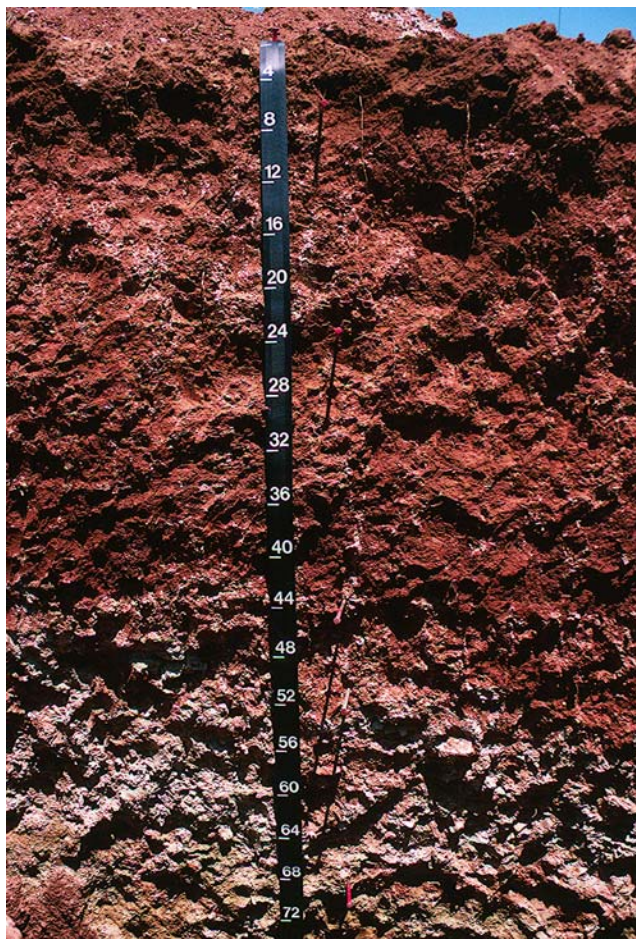


Figure 3.—Profile of Aspermont silt loam. Permian-age red-bed sediments are below a depth of about 50 inches.

common fine and medium roots; common very fine and fine and few medium pores; slightly effervescent; moderately alkaline; clear smooth boundary. (4 to 15 inches thick)

Bw—6 to 15 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, friable; common fine and few medium roots; common very fine and fine pores; strongly effervescent; moderately alkaline; clear smooth boundary. (6 to 22 inches thick)

Bk1—15 to 21 inches; yellowish red (5YR 4/6) silty clay loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; common fine and few coarse roots; few very fine and fine pores; common fine concretions, few fine masses, and few threads of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

Bk2—21 to 33 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; common fine and few coarse roots; few very fine and fine pores; common fine and medium concretions and many medium and coarse masses of calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.

Soil Survey of Jackson County, Oklahoma

- Bk3—33 to 42 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; common fine and few coarse roots; common very fine and fine pores; few fine and medium concretions and common medium and coarse masses of calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary. (Combined thickness of the Bk horizons ranging from 8 to 30 inches)
- BcK—42 to 58 inches; reddish brown (2.5YR 5/4) clay loam, reddish brown (2.5YR 4/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; extremely hard, very firm; few fine and few coarse roots; few very fine and fine pores; very few iron-manganese stains on vertical and horizontal faces of peds; common medium and coarse masses of calcium carbonate; strongly effervescent; 1 percent claystone paragravel; moderately alkaline; clear smooth boundary. (0 to 20 inches thick)
- 2Cd1—58 to 66 inches; reddish brown (2.5YR 4/4) silty clay; massive; extremely hard, very firm; few fine roots in cracks; very few iron-manganese stains; slightly effervescent; 20 percent claystone paragravel; moderately alkaline; clear wavy boundary.
- 2Cd2—66 to 80 inches; 90 percent dark red (2.5YR 3/6), 5 percent greenish gray (5GY 6/1), and 5 percent greenish gray (5G 5/1), interbedded claystone and siltstone bedrock; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches

Depth to densic material: 40 to 60 inches

Depth to paralithic contact: More than 60 inches

Depth to a calcic horizon: 12 to 32 inches

Particle-size control section (weighted average):

Clay content—18 to 35 percent

Content of fine sand or coarser sand—0 to 15 percent

Content of rock fragments—0 to 10 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—loam, silt loam, silty clay loam, or clay loam

Clay content—18 to 35 percent

Calcium carbonate equivalent—2 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—0 to 1 percent

Sodium adsorption ratio (SAR)—0 to 2

Effervescence—very slightly effervescent to strongly effervescent

Reaction—moderately alkaline

Bw horizon (where present):

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—loam, silt loam, silty clay loam, or clay loam

Clay content—18 to 35 percent

Calcium carbonate equivalent—5 to 15 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—0 to 1 percent

Sodium adsorption ratio (SAR)—0 to 2

Effervescence—very slightly effervescent to strongly effervescent

Reaction—moderately alkaline

Soil Survey of Jackson County, Oklahoma

Bk horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6
Texture—loam, silt loam, silty clay loam, or clay loam
Clay content—18 to 35 percent
Calcium carbonate equivalent—10 to 40 percent
Visible secondary carbonates—few to many fine to coarse concretions, masses, and threads
Electrical conductivity (EC)—dS/m of 0 to 2
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—0 to 4
Effervescence—strongly effervescent or violently effervescent
Reaction—moderately alkaline

BCK or 2BCK horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6
Texture—loam, silt loam, silty clay loam, or clay loam
Clay content—18 to 40 percent
Content of rock fragments—0 to 10 percent paragravel
Calcium carbonate equivalent—5 to 25 percent
Visible secondary carbonates—few to many fine to coarse concretions, masses, and threads
Electrical conductivity (EC)—dS/m of 0 to 4
Gypsum content—0 to 5 percent
Sodium adsorption ratio (SAR)—0 to 6
Effervescence—strongly effervescent or violently effervescent
Reaction—moderately alkaline

2Cd horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 to 6
Texture—clay loam, silty clay loam, silty clay, clay, or interbedded siltstone and claystone; thin layers of fractured dolomite or limestone in some pedons
Clay content—27 to 60 percent
Permeability—0.0015 to 0.02 in/in
Moist bulk density (g/cc)—1.70 to 2.25 (high enough that roots can enter only in cracks or fractures in the horizon, which consists of material that qualifies as densic)
Excavation difficulty—moderate or high
Effervescence—very slightly effervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Beckman Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Moderately well drained

Flooding: Frequently flooded or occasionally flooded for very brief periods, mainly during the spring and summer months

Parent material and geologic age: Calcareous, saline, clayey alluvial sediments of Recent age derived from shale of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Uplands

Soil Survey of Jackson County, Oklahoma

Landform: Flood plains

Slope: 0 to 1 percent

Mean annual precipitation: 22 to 32 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine, mixed, active, calcareous, thermic Vertic
Ustifluvents

Associated Soils

These are soils of the Clairemont, Heman, Knoco, Mangum, Spur, Treadway, Vernon, and Wheatwood series. Clairemont, Spur, and Wheatwood soils are in landscape positions similar to those of the Beckman soils. They have less than 35 percent clay in the control section and do not have a water table within a depth of 6 feet. In addition, Spur soils have a mollic epipedon. Heman soils have strongly contrasting particle-size classes in the control section. Knoco and Vernon soils occur on the adjacent uplands and have shale bedrock within 40 inches of the surface. Mangum soils are on the slightly higher flood plains and do not have a water table within a depth of 6 feet. Treadway soils are on the higher footslopes and alluvial fans.

Typical Pedon

Beckman clay, on a nearly level flood plain, in an area of rangeland; Beckham County, Oklahoma; 3 miles south and 2 $\frac{1}{4}$ miles east of Delhi, Oklahoma; 600 feet east and 520 feet north of the southwest corner of sec. 28, T. 8 N., R. 23 W.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 6 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate fine granular structure; extremely hard, very firm; few fine roots; cracks that are $\frac{1}{2}$ to 1 centimeter wide; slightly saline; strongly effervescent; moderately alkaline; clear smooth boundary. (4 to 23 inches thick)
- Cy1—6 to 18 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; massive; extremely hard, very firm; few fine roots; many thin strata of silty clay loam; few masses of gypsum and other salts; about 10 percent gypsum crystals, by volume; cracks, $\frac{1}{2}$ to 1 centimeter wide, filled with reddish brown (5YR 4/4) clay; moderately saline; strongly effervescent; moderately alkaline; clear smooth boundary. (8 to 20 inches thick)
- Cy2—18 to 40 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; massive; extremely hard, very firm; few fine roots in cracks; many thin strata of silty clay loam; few fine fragments of gray shale; few pressure faces; few masses of gypsum and other salts; about 25 percent gypsum crystals, by volume; cracks, $\frac{1}{2}$ to 1 centimeter wide, filled with reddish brown (5YR 4/4) clay; moderately saline; few films, masses, and concretions of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary. (10 to 30 inches thick)
- Cy3—40 to 60 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; massive; extremely hard, very firm; many thin strata of silt loam and silty clay loam; few fine fragments of gray shale; few masses of gypsum and other salts; about 5 percent gypsum crystals, by volume; moderately saline; few films, masses, and concretions of calcium carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches

Depth to secondary calcium carbonates: 0 to 12 inches

Depth to salt accumulations: 0 to 12 inches

Soil Survey of Jackson County, Oklahoma

Depth to endosaturation: 36 to 72 inches

Vertic features: Cracks, 0.5 to 1 centimeter wide, extending from the surface to a depth of 40 inches

Particle-size control section (weighted average):

Clay content—40 to 60 percent

Content of rock fragments—0 to 3 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4; horizon thickness of less than 10 inches where moist value and chroma are less than 3.5

Texture—clay or clay loam

Clay content—35 to 60 percent

Calcium carbonate equivalent—1 to 5 percent

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 5 percent

Sodium adsorption ratio (SAR)—0 to 4

Effervescence—very slightly effervescent to strongly effervescent

Reaction—moderately alkaline

C horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 7 (3 or 6 moist), and chroma of 3 to 6

Texture—clay or silty clay with few to many thin strata of loam, silt loam, or silty clay loam

Clay content—40 to 60 percent

Calcium carbonate equivalent—5 to 15 percent

Visible secondary carbonates—few or common films, threads, and concretions

Electrical conductivity (EC)—dS/m of 4 to 16

Gypsum content—2 to 25 percent

Sodium adsorption ratio (SAR)—2 to 8

Effervescence—strongly effervescent or violently effervescent

Reaction—moderately alkaline

Brico Series

Major land resource area: Wichita Mountains (82B)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Colluvial material weathered from dominantly granitic rocks of Cambrian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Mountains

Landform: Mountains

Position: Mountain flanks and mountain bases

Slope: 3 to 20 percent

Mean annual precipitation: 25 to 30 inches

Mean annual air temperature: 61 to 63 degrees F

Thornthwaite PE index: 38 to 44

Taxonomic classification: Clayey-skeletal, mixed, active, thermic Typic Argiustolls

Associated Soils

These are soils of the Hollister and Lawton series. They occur in the lower areas, below the footslopes occupied by Brico soils. Hollister and Lawton soils have less than 35 percent rock fragments in the solum. In addition, Hollister soils have a mollic epipedon that is more than 20 inches thick.

Typical Pedon

Brico cobbly loam, in an area of rangeland; Kiowa County, Oklahoma; about 4 miles north and 5 miles east of Mountain Park; 600 feet south and 50 feet east of the northwest corner of sec. 11, T. 3 N., R. 16 W; latitude—34 degrees, 45 minutes, 10 seconds N.; longitude—98 degrees, 51 minutes, 39 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- A1—0 to 5 inches; brown (7.5YR 5/2) cobbly loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; slightly hard, friable; about 10 percent, by volume, granitic fragments 2 millimeters to 3 inches in diameter and 20 percent, by volume, cobblestones 3 to 10 inches in diameter; slightly acid; clear smooth boundary. (4 to 8 inches thick)
- A2—5 to 11 inches; brown (7.5YR 4/2) cobbly loam, dark brown (7.5YR 3/2) moist; strong fine granular structure; slightly hard, friable; common pores and wormcasts; about 15 percent, by volume, granitic fragments 2 millimeters to 3 inches in diameter and 20 percent, by volume, cobblestones 3 to 10 inches in diameter; slightly acid; clear smooth boundary. (5 to 9 inches thick)
- Bt1—11 to 24 inches; reddish brown (5YR 4/4) very cobbly clay, dark reddish brown (5YR 3/4) moist; strong medium blocky structure; very hard, very firm; common distinct dark reddish brown (5YR 3/3) clay films on faces of peds; about 20 percent, by volume, granitic fragments 2 millimeters to 3 inches in diameter and 30 percent, by volume, cobblestones 3 to 10 inches in diameter; shiny surfaces on peds; neutral; gradual smooth boundary. (5 to 28 inches thick)
- Bt2—24 to 40 inches; red (2.5YR 4/6) very cobbly clay loam, dark red (2.5YR 3/6) moist; strong fine and medium blocky structure; very hard, very firm; common distinct clay films on faces of peds; about 20 percent, by volume, granitic fragments 2 millimeters to 3 inches in diameter and 30 percent, by volume, cobblestones 3 to 10 inches in diameter; neutral; gradual smooth boundary. (14 to 30 inches thick)
- BC—40 to 72 inches; red (2.5YR 5/6) extremely cobbly clay loam, red (2.5YR 4/6) moist; weak fine subangular blocky structure; very hard, very firm; weakly cemented; 30 percent, by volume, granitic fragments 2 millimeters to 3 inches in diameter and 40 percent, by volume, cobblestones 3 to 10 inches in diameter; neutral.

Range in Characteristics

Thickness of the solum: More than 80 inches

Thickness of the mollic epipedon: 10 to 20 inches

Particle-size control section (weighted average):

Clay content—35 to 60 percent

Content of rock fragments—35 to 75 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 5YR or 7.5YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 or 3

Texture—loam, gravelly loam, cobbly loam, or very cobbly loam

Clay content—15 to 27 percent

Soil Survey of Jackson County, Oklahoma

Content of rock fragments, by volume—5 to 30 percent granitic fragments less than 3 inches in diameter and 2 to 45 percent granitic fragments more than 3 inches in diameter

Reaction—slightly acid or neutral

Bt horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6

Texture—cobbley clay loam, very cobbley clay loam, cobbley clay, or very cobbley clay

Clay content—35 to 60 percent

Content of rock fragments, by volume—10 to 30 percent granitic fragments less than 3 inches in diameter and 10 to 45 percent granitic fragments more than 3 inches in diameter

Reaction—slightly acid or neutral

BC horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6

Texture—cobbley clay loam, very cobbley clay loam, or extremely cobbley clay loam

Clay content—27 to 35 percent

Content of rock fragments, by volume—10 to 50 percent granitic fragments less than 3 inches in diameter and 10 to 45 percent granitic fragments more than 3 inches in diameter

Reaction—slightly acid or neutral

Burford Series

Major land resource area: Central Rolling Red Plains, Eastern Part (78C)

Depth class: Deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, silty material overlying red-bed shale of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Uplands

Landform: Hills

Position: Interfluvies and side slopes

Slope: 1 to 20 percent

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-silty, mixed, superactive, thermic Typic Haplustepts

Associated Soils

These are soils of the Carey, Tillman, Vernon, and Woodward series. Carey and Tillman soils have a mollic epipedon and Bt horizons. Vernon soils have more than 35 percent clay in the 10- to 40-inch textural control section. Woodward soils have less than 18 percent clay in the 10- to 40-inch textural control section.

Typical Pedon

Burford silt loam, in an area of rangeland; Woods County, Oklahoma; 6 miles east and 2 miles south of Freedom Oklahoma; 3,500 feet north and 2,180 feet west of the southeast corner of sec. 10, T. 26 N., R. 17 W.

(Colors are for dry soil unless otherwise indicated.)

Soil Survey of Jackson County, Oklahoma

- A—0 to 9 inches; reddish brown (5YR 4/4) silt loam, dark reddish brown (5YR 3/4) moist; moderate fine and medium granular structure; hard, friable; many fine roots; common wormcasts; very few very fine nodules of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary. (5 to 15 inches thick)
- Bw—9 to 19 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate fine and medium subangular blocky structure; very hard, very firm; common fine roots; common wormcasts; few fine nodules of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary. (7 to 22 inches thick)
- Bk—19 to 25 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; very hard, very firm; few fine roots; common fine and medium soft masses and nodules of calcium carbonate, about 15 percent, by volume; strongly effervescent; moderately alkaline; clear smooth boundary. (8 to 28 inches thick)
- 2BCK—25 to 32 inches; reddish brown (2.5YR 4/4) clay, dark red (2.5YR 3/6) moist; strong fine and medium angular blocky structure; extremely hard, extremely firm; few fine roots; few fine and medium nodules and threads of calcium carbonate, about 7 percent, by volume; strongly effervescent; moderately alkaline; clear smooth boundary. (0 to 12 inches thick)
- 2C—32 to 42 inches; red (2.5YR 4/6) shaly clay, dark red (2.5YR 3/6) moist; massive; extremely hard, extremely firm; few fine roots in cracks; common threads of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary. (0 to 25 inches thick)
- 2Cd—42 to 80 inches; dark red (2.5YR 4/6), interbedded shale and shaly clay, dark red (2.5YR 3/6) moist; massive; extremely hard, extremely firm; many seams of gypsum crystals; common thin strata and pockets of bluish gray shale; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 24 to 50 inches

Depth to densic material: 40 to 60 inches

Depth to lithologic discontinuity: 24 to 60 inches

Depth to secondary calcium carbonates: 12 to 32 inches

Particle-size control section (weighted average):

Clay content—20 to 35 percent

CEC/clay ratio—more than 0.6

A horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—loam, silt loam, silty clay loam, or clay loam

Clay content—18 to 35 percent

Calcium carbonate equivalent—0 to 10 percent

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Bw horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—loam, silt loam, silty clay loam, or clay loam

Clay content—20 to 35 percent

Calcium carbonate equivalent—2 to 15 percent

Visible secondary carbonates—in some pedons, none; in other pedons, few fine or medium films, nodules, or masses

Effervescence—very slightly effervescent to strongly effervescent

Reaction—moderately alkaline

Soil Survey of Jackson County, Oklahoma

Bk horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6
Texture—loam, silt loam, silty clay loam, or clay loam
Clay content—20 to 35 percent
Calcium carbonate equivalent—5 to 20 percent
Visible secondary carbonates—few to many fine or medium films, nodules, or masses
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

BC or 2BC horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6
Texture—clay loam, silty clay loam, or clay
Clay content—27 to 50 percent
Calcium carbonate equivalent—5 to 15 percent
Visible secondary carbonates—in some pedons, none; in other pedons, few or common fine or medium threads, films, nodules, or masses
Electrical conductivity (EC)—dS/m of 0 to 2
Gypsum content—0 to 2 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

2C horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6
Texture—clay loam, silty clay loam, or clay
Clay content—27 to 50 percent
Calcium carbonate equivalent—5 to 15 percent
Visible secondary carbonates—in some pedons, none; in other pedons, few or common fine or medium threads, films, or masses
Electrical conductivity (EC)—dS/m of 0 to 2
Gypsum content—0 to 2 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

2Cd horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6
Texture—interbedded shale, siltstone, or silty sandstone with texture of clay loam, silty clay loam, silty clay, or clay
Moist bulk density (g/cc)—1.70 to 2.25 (high enough that roots can enter only in cracks or fractures in the horizon, which consists of material that qualifies as densic)
Excavation difficulty—moderate or high
Effervescence—very slightly effervescent to strongly effervescent
Reaction—moderately alkaline

Cobb Series

Major land resource area: Central Rolling Red Plains, Eastern Part (78C)

Depth class: Moderately deep

Drainage class: Well drained

Parent material and geologic age: Loamy sediments weathered from weakly cemented sandstone of the San Angelo Formation of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Soil Survey of Jackson County, Oklahoma

Physiographic sub-province: Osage Plains

Landscape: Uplands

Landform: Hills

Position: Interfluves and side slopes

Slope: 0 to 8 percent

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, active, thermic Typic Haplustalfs

Associated Soils

These are soils of the Abilene, Bluegrove, Cosh, Decobb, Grandfield, Miles, Rochelle, Spade, Tillman, Tilvern, Vernon, and Westill series. Abilene soils have a mollic epipedon and are in the lower alluvial areas or on the lower footslopes. Bluegrove, Tilvern, and Vernon soils are in landscape positions similar to those of the Cobb soils or in slightly lower positions and have a fine textured particle-size control section. Cosh soils are shallow to sandstone bedrock and are in slightly convex areas on the higher parts of the landscape. Decobb soils are very deep to sandstone and are on the slightly lower parts of the landscape. Grandfield and Miles soils are on the slightly lower parts of the landscape and formed in loamy alluvial sediments of Pleistocene age. Rochelle soils are on stream terraces and have a gravelly substratum. Spade soils are in landscape positions similar to those the Cobb soils, have a cambic horizon, and are calcareous to the surface. Tillman and Westill soils have a mollic epipedon, are on the slightly lower parts of the landscape, and formed in red alluvium.

Typical Pedon

Cobb fine sandy loam, in an area of cropland; Foard County, Texas; from the intersection of Texas Highway 6 and U.S. Highway 70 in Crowell, 1.5 miles west on U.S. Highway 70, about 0.3 mile north on a county road, and 0.2 mile west in cropland; latitude—33 degrees, 59 minutes, 28 seconds N.; longitude—99 degrees, 45 minutes, 15 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- Ap—0 to 8 inches; reddish brown (5YR 4/3) fine sandy loam, dark reddish brown (5YR 3/3) moist; structureless; hard, very friable; few fine roots; slightly acid; gradual smooth boundary. (3 to 12 inches thick)
- Bt1—8 to 22 inches; reddish brown (5YR 4/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; weak coarse prismatic structure parting to weak medium subangular blocky; very hard, friable; few fine roots; few fine pores; slightly acid; clear wavy boundary. (8 to 18 inches thick)
- Bt2—22 to 30 inches; reddish brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to weak subangular blocky; very hard, friable; neutral; abrupt irregular boundary. (6 to 18 inches thick)
- Cr—30 to 60 inches; weakly consolidated, reddish sandstone with common distinct coatings of calcium carbonate in the fissures or crevices; neutral.

Range in Characteristics

Thickness of the solum: 20 to 40 inches

Depth to paralithic contact: 20 to 40 inches

Particle-size control section (weighted average):

Clay content—18 to 35 percent

CEC/clay ratio—0.4 to 0.6

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A horizon:

Color—hue of 5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 or 4
Texture—fine sandy loam or loamy fine sand
Clay content—6 to 18 percent
Electrical conductivity (EC)—dS/m of 0 to 2
Reaction—slightly acid or neutral

Bt horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6
Texture—sandy clay loam or clay loam
Clay content—18 to 35 percent
Content of rock fragments, by volume—0 to 10 percent sandstone fragments less than 3 inches in diameter
Calcium carbonate equivalent—0 to 5 percent
Electrical conductivity (EC)—dS/m of 0 to 2
Effervescence—noneffervescent to slightly effervescent
Reaction—slightly acid to moderately alkaline

Cr horizon:

Color—hue of 2.5YR to 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 6
Kind of rock—extremely weakly cemented to strongly cemented sandstone bedrock that has hardness of less than 3 on the Mohs scale
Moist bulk density (g/cc)—1.85 to 2.35
Excavation difficulty—moderate or high
Visible secondary carbonates—thin coatings of calcium carbonate in fissures or crevices in most pedons
Effervescence—noneffervescent to slightly effervescent
Reaction—slightly acid to moderately alkaline

Cottonwood Series

Major land resource area: Central Rolling Red Plains, Western Part (78B)

Depth class: Very shallow or shallow

Drainage class: Well drained

Parent material and geologic age: Residuum derived from gypsum bedrock of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Karstland

Landform: Hills

Position: Interfluves and side slopes

Slope: 1 to 45 percent

Mean annual precipitation: 21 to 26 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 40

Taxonomic classification: Loamy, mixed, superactive, calcareous, thermic Lithic Ustorthents

Associated Soils

These are soils of the Aspermont, Harmon, Knoco, La Casa, Nipsum, Quanah, Talpa, and Vinson series. Aspermont soils are deep to Permian red-bed sediments and are on the slightly lower side slopes. Harmon, Knoco, and Talpa soils are in landscape positions similar to those of the Cottonwood soils. Harmon and Talpa soils

formed in material weathered from dolomitic limestone, and Knoco soils formed in material weathered from reddish claystone. La Casa, Nipsum, and Quanah soils have a mollic epipedon, are very deep to bedrock, and are on the lower footslopes. Vinson soils have a mollic epipedon, are moderately deep to gypsum beds, and are on the slightly lower side slopes.

Typical Pedon

Cottonwood silt loam, on a slope of 2 percent in an area of rangeland; Jackson County, Oklahoma; from the intersection of Oklahoma State Highways 6 and 34 northeast of Eldorado, about 1 mile north on Highway 34, about 0.7 mile west on a county road, and 960 feet south in rangeland; 3,600 feet south and 1,650 feet east of the northwest corner of sec. 25, T. 1 N., R. 23 W.; latitude—34 degrees, 31 minutes, 34 seconds N.; longitude—99 degrees, 34 minutes, 23 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 5 inches; brown (7.5YR 5/3) silt loam, brown (7.5YR 4/3) moist; weak medium granular structure; soft, very friable; common fine roots and pores; few fine concretions of calcium carbonate; slightly effervescent; moderately alkaline; abrupt wavy boundary. (3 to 14 inches thick)
- Cy—5 to 8 inches; very pale brown (10YR 8/2) gypsiferous silt loam, light gray (10YR 7/2) moist; massive; hard, very firm; few fine roots following seams and crevices; strongly effervescent; moderately alkaline; clear wavy boundary. (0 to 5 inches thick)
- Cr—8 to 15 inches; very pale brown (10YR 8/2), weakly cemented gypsum bedrock; few fine roots following seams and crevices; strongly effervescent; moderately alkaline; clear wavy boundary. (0 to 10 inches thick)
- R—15 to 20 inches; very pale brown (10YR 8/2), strongly cemented gypsum bedrock that is strongly effervescent in the upper part and grades to very slightly effervescent with depth; moderately alkaline.

Range in Characteristics

Thickness of the solum: 3 to 14 inches

Depth to lithic contact: 3 to 14 inches

Depth to secondary calcium carbonates: 4 inches or less

Particle-size control section (weighted average):

Clay content—18 to 35 percent

Content of rock fragments—0 to 3 percent

CEC/clay ratio—0.6 or more

A horizon:

Color—hue of 5YR to 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 6

Texture—loam, silt loam, clay loam, or silty clay loam

Clay content—18 to 35 percent

Calcium carbonate equivalent—5 to 30 percent

Visible secondary carbonates—few or common fine or medium concretions

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—2 to 20 percent

Effervescence—slightly effervescent to violently effervescent

Reaction—moderately alkaline

Cy horizon (where present):

Color—hue of 7.5YR to 5Y, value of 5 to 8 (4 to 7 moist), and chroma of 1 to 6

Texture—gypsiferous silt loam, gypsiferous loam, gypsiferous silty clay loam, or gypsiferous clay loam

Calcium carbonate equivalent—5 to 30 percent
Electrical conductivity (EC)—dS/m of 0 to 4
Gypsum content—40 to 90 percent
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

Cr horizon (where present):

Color—hue of 7.5YR to 5Y, value of 6 to 8 (5 to 7 moist), and chroma of 1 to 6
Kind of rock—extremely weakly cemented to moderately cemented gypsum
Moist bulk density (g/cc)—1.85 to 2.35
Reaction—moderately alkaline

R horizon:

Color—hue of 7.5YR to 5Y, value of 6 to 8 (5 to 7 moist), and chroma of 1 to 6
Kind of rock—massive crystalline gypsum or alabaster bedrock that is 5 to 15 feet thick, is strongly cemented or very strongly cemented, and is interbedded with reddish brown claystone and thin layers of dolomite and greenish gray claystone
Moist bulk density (g/cc)—1.85 to 2.35
Excavation difficulty—very high or extremely high
Reaction—moderately alkaline
Upper boundary—a root-restrictive lithic contact

Decobb Series

Major land resource area: Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy sediments weathered from weakly cemented sandstone of the San Angelo Formation of Permian age (fig. 4)

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Uplands

Landform: Hills

Position: Interfluves and side slopes

Slope: 0 to 5 percent

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, active, thermic Typic Haplustalfs

Associated Soils

These are soils of the Cobb, Cosh, Grandfield, Madge, Miles, Quinlan, Tillman, Tilvern, Vernon, and Westill series. Cobb soils are in the higher adjacent landscape positions. Cosh and Quinlan soils are less than 20 inches deep to sandstone and are in the higher convex areas. Grandfield, Madge, and Miles soils are more than 80 inches deep to bedrock and formed in alluvial terrace sediments in the lower landscape positions. In addition, Madge soils have a mollic epipedon. Tillman and Westill soils have a mollic epipedon and a fine textured particle-size control section and are in the lower landscape positions. Tilvern and Vernon soils have a cambic horizon and a fine textured particle-size control section, are less than 60 inches deep to bedrock, and are in the lower landscape positions.

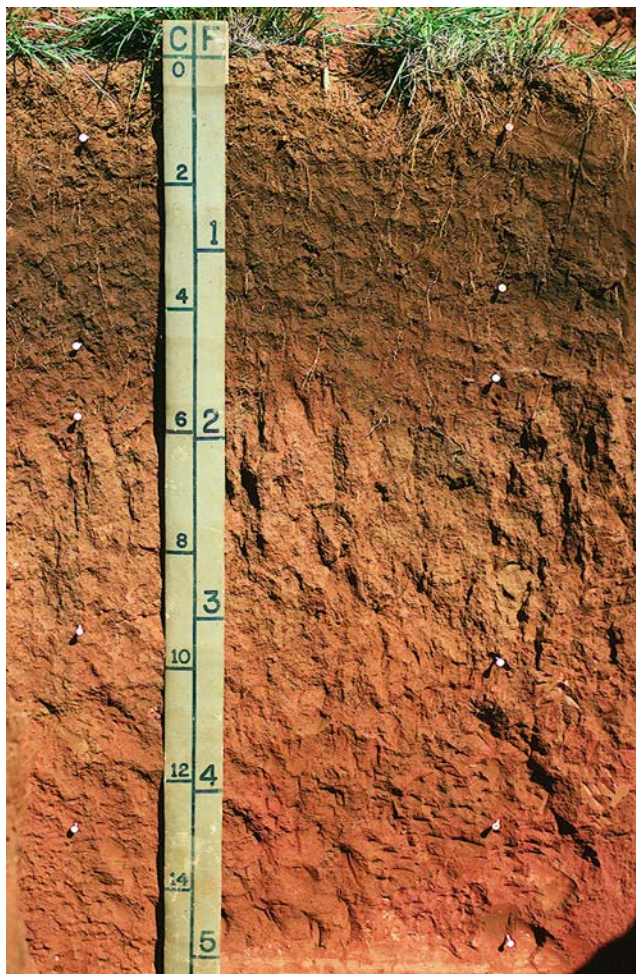


Figure 4.—Profile of Decobb very fine sandy loam. Sandstone bedrock is below a depth of 5 feet. The left side of the scale is in centimeters times 10; the right side is in feet.

Typical Pedon

Decobb very fine sandy loam, on a slope of 1 percent in an area of cropland; Jackson County, Oklahoma; from the intersection of U.S. Highways 283 and 64 in Altus, 9 miles south on U.S. Highway 283, about 0.5 mile west and 0.6 mile south on a county road, and 200 feet east in cropland; 1,720 feet north and 200 feet east of southwest corner of sec. 6, T. 1 S., R. 20 W.; USGS quadrangle—Elmer; latitude—34 degrees, 29 minutes, 53 seconds N.; longitude—99 degrees, 20 minutes, 28 seconds W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 8 inches; reddish brown (5YR 4/4) very fine sandy loam, dark reddish brown (5YR 3/4) moist; weak fine and medium granular structure; slightly hard, very friable; common fine and medium roots; noneffervescent; slightly acid; abrupt smooth boundary. (6 to 12 inches thick)

A—8 to 18 inches; reddish brown (5YR 4/4) loam, dark reddish brown (5YR 3/4) moist; moderate fine and medium granular structure; slightly hard, very friable; common fine and medium roots; common wormcasts; noneffervescent; neutral; clear smooth boundary. (0 to 10 inches thick)

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- Bt1—18 to 36 inches; reddish brown (5YR 4/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; common fine and medium roots; common very fine and fine pores; many prominent clay films on faces of peds and in pores; common wormcasts; noneffervescent; moderately alkaline; gradual smooth boundary.
- Bt2—36 to 50 inches; reddish brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; few fine and medium roots; few very fine and fine pores; many distinct clay films on faces of peds; common wormcasts; noneffervescent; moderately alkaline; gradual smooth boundary. (Combined thickness of the Bt horizons ranging from 20 to 60 inches)
- BC—50 to 63 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure; hard, friable; few very fine and fine roots; noneffervescent; moderately alkaline; clear smooth boundary. (6 to 35 inches thick)
- Cr—63 to 80 inches; red (2.5YR 5/6), weakly cemented sandstone bedrock, red (2.5YR 4/6) moist; brittle; noneffervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to 80 inches

Depth to paralithic contact: 60 to 80 inches

Particle-size control section (weighted average):

Clay content—18 to 35 percent

CEC/clay ratio—0.4 to 0.6

Ap and A horizons:

Color—hue of 5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—fine sandy loam, very fine sandy loam, or loam

Clay content—6 to 18 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

Bt horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 to 8

Texture—clay loam, sandy clay loam, or loam

Clay content—18 to 35 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly acid to moderately alkaline

Btk horizon (where present):

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 6 or 8

Texture—sandy clay loam, clay loam, or loam

Clay content—18 to 35 percent

Calcium carbonate equivalent—2 to 10 percent

Visible secondary carbonates—few or common fine or medium concretions, masses, or threads

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—very slightly effervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

BC or BCk horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 6 or 8
Texture—sandy clay loam, fine sandy loam, or loam
Clay content—10 to 35 percent
Calcium carbonate equivalent—0 to 10 percent
Visible secondary carbonates—in some pedons, none; in other pedons, few or common fine or medium concretions, masses, or threads
Electrical conductivity (EC)—dS/m of 0 to 2
Effervescence—noneffervescent to strongly effervescent
Reaction—slightly acid to moderately alkaline

Cr horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 6 to 8
Kind of rock—weakly cemented sandstone bedrock that is interbedded with thin layers of siltstone and claystone
Moist bulk density (g/cc)—1.85 to 2.35
Excavation difficulty—moderate or high
Effervescence—noneffervescent to slightly effervescent
Reaction—slightly acid to moderately alkaline

Devol Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy and sandy alluvial and eolian sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Sand sheets

Position: Dunes and interdune areas

Slope: 0 to 20 percent

Mean annual precipitation: 20 to 30 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Coarse-loamy, mixed, superactive, thermic Typic Haplustalfs

Associated Soils

These are soils of the Carman, Carwile, Eda, Grandfield, Grandmore, Lovedale, Meno, Miles, Nobscot, Ruella, Tipton, Tivoli, and Waynoka series. Carman, Grandfield, Grandmore, Lovedale, Ruella, and Tipton soils have a fine-loamy control section. In addition, Carman, Lovedale, and Tipton soils have a mollic epipedon. Carwile soils have a fine textured control section. Eda soils have an argillic horizon of loamy fine sand and are in the slightly more undulating areas. Meno soils have redoximorphic features. Miles soils have a fine-loamy control section and do not decrease in clay content within a depth of 60 inches. Nobscot soils have sandy surface soil more than 20 inches thick and are on the slightly higher ridges and side slopes. Tivoli soils do not have an argillic horizon and are on dunes or in hummocky areas. Waynoka soils are characterized by a lithologic discontinuity.

Typical Pedon

Devol loamy fine sand, in a cultivated area; Tillman County, Oklahoma; about 3 miles north and 1 mile east of Tipton; 300 feet south and 150 feet east of the northwest corner of NE¹/₄ sec. 20, T. 1 N., R. 18 W.

(Colors are for dry soil unless otherwise indicated.)

- Ap—0 to 14 inches; light brown (7.5YR 6/4) loamy fine sand, brown (7.5YR 4/4) moist; single grained; soft, very friable; neutral; the upper 8 inches occurring as a plow layer that does not differ appreciably from the rest of the horizon; neutral; gradual smooth boundary. (12 to 18 inches thick)
- Bt—14 to 27 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak medium prismatic structure; slightly hard, very friable; clay bridges between sand grains and a few discontinuous clay films on prism faces; slightly alkaline; gradual smooth boundary. (8 to 24 inches thick)
- BC—27 to 40 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure; slightly hard, very friable; slightly alkaline; gradual smooth boundary. (8 to 24 inches thick)
- C—40 to 64 inches; brown (7.5YR 5/4) loamy fine sand, brown (7.5YR 4/4) moist; massive; slightly hard, very friable; noneffervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 30 to 60 inches

Depth to secondary calcium carbonates: More than 30 inches

Particle-size control section (weighted average):

Clay content—8 to 18 percent

Content of rock fragments—less than 2 percent

CEC/clay ratio—more than 0.6

A horizon:

Color—hue of 5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6

Texture—loamy sand, loamy fine sand, or fine sandy loam

Clay content—2 to 18 percent

Content of rock fragments, by volume—0 to 2 percent rounded gravel less than 3 inches in diameter

Effervescence—noneffervescent

Reaction—moderately acid to slightly alkaline

Bt horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6

Texture—sandy loam, fine sandy loam, or loamy fine sand

Clay content—2 to 18 percent

Content of rock fragments, by volume—0 to 2 percent rounded gravel less than 3 inches in diameter

Effervescence—noneffervescent

Reaction—slightly acid to moderately alkaline

BC horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6

Texture—fine sandy loam, loamy fine sand, or loamy sand

Clay content—2 to 18 percent

Content of rock fragments, by volume—0 to 2 percent rounded gravel less than 3 inches in diameter

Effervescence—noneffervescent

Reaction—neutral to moderately alkaline

C horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 7 (3 to 6 moist), and chroma of 4 to 8
Texture—fine sandy loam, sandy loam, loamy fine sand, loamy sand, or fine sand
Clay content—2 to 10 percent
Content of rock fragments, by volume—0 to 2 percent rounded gravel less than 3 inches in diameter
Calcium carbonate equivalent—0 to 5 percent
Effervescence—noneffervescent to slightly effervescent
Reaction—neutral to moderately alkaline

Eastall Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Poorly drained

Ponding: Occurring for long or very long periods, mainly during the spring and summer months

Parent material and geologic age: Clayey lacustrine sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains, karstland, and uplands

Landform: Potholes

Position: Depressions

Slope: 0 to 1 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine, smectitic, thermic Ustic Epiaquerts

Associated Soils

These are soils of the Abilene, Hollister, La Casa, Leeray, Nipsum, Roscoe, Rotan, Rowena, and Sagerton series. Abilene, La Casa, Rotan, and Sagerton soils have an argillic horizon, are well drained, and are in the higher areas. Hollister and Leeray soils are well drained and are in the higher areas. Nipsum and Rowena soils have a cambic horizon without slickensides, are well drained, and are in the higher areas. Roscoe soils are in slight depressions and are ponded for less than 7 days following heavy rains.

Typical Pedon

Eastall silty clay (fig. 5), in an area of cropland; Jackson County, Oklahoma; from the intersection of Oklahoma State Highways 34 and 6 east of Eldorado, 2.5 miles west on State Highway 6, about 0.75 mile north on a county road, and 2,500 feet north in cropland; 2,500 feet north and 2,100 feet west of the southeast corner of sec. 34, T. 1 N., R. 23 W.; USGS quadrangle—Prairie Hill, Oklahoma; latitude—34 degrees, 30 minutes, 50.1 seconds N.; longitude—99 degrees, 36 minutes, 12.7 seconds W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 5 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to moderate medium granular; very hard, firm; common very fine and fine roots; few

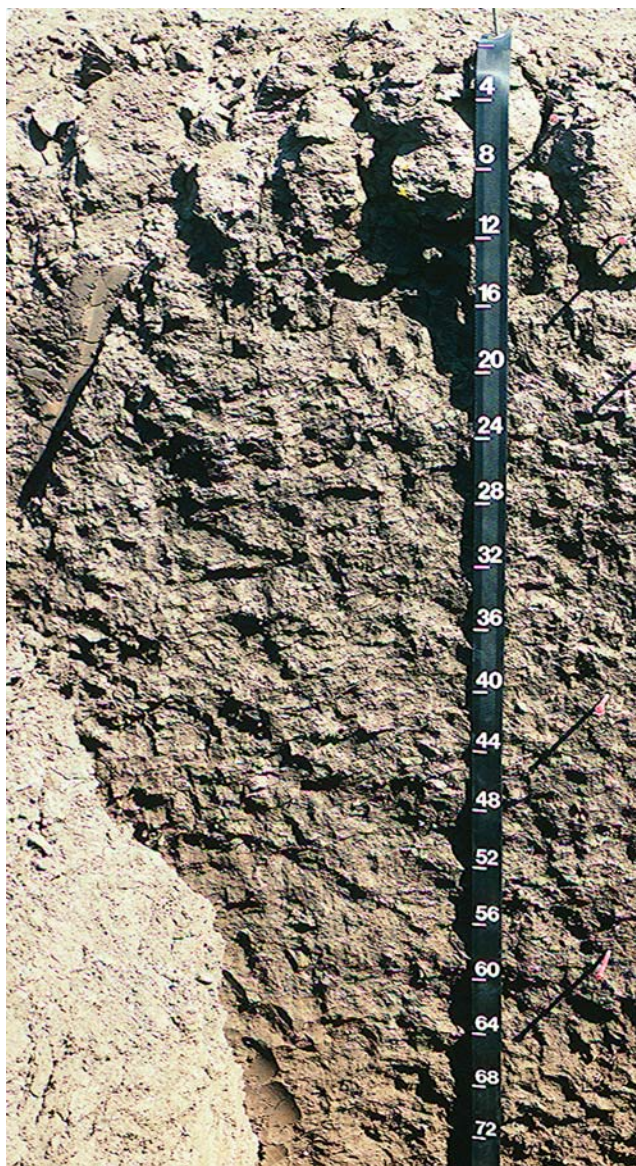


Figure 5.—Profile of Eastall silty clay. The dark gray colors in the upper part of the profile are caused by ponding and episaturation.

very fine and fine pores; noneffervescent; slightly alkaline; abrupt smooth boundary.

A—5 to 12 inches; grayish brown (10YR 5/2), interior, and gray (10YR 5/1), exterior, silty clay, very dark grayish brown (10YR 3/2), interior, moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; common very fine and fine roots; few very fine and fine pores; few fine iron-manganese masses; noneffervescent; slightly alkaline; clear smooth boundary. (Combined thickness of the Ap and A horizons ranging from 5 to 18 inches)

Bw—12 to 19 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; moderate medium angular blocky structure; very hard, very firm; common very fine and fine roots; common wedge-shaped peds; few distinct

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pressure faces; few fine iron-manganese masses; noneffervescent; moderately alkaline; clear smooth boundary. (0 to 16 inches thick)

Bss1—19 to 56 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; moderate medium angular blocky structure; very hard, very firm; common very fine and fine roots; common wedge-shaped peds; many prominent slickensides; few fine iron-manganese masses; noneffervescent; moderately alkaline; gradual smooth boundary.

Bss2—56 to 76 inches; brown (7.5YR 5/2) silty clay, brown (7.5YR 4/2) moist; moderate medium subangular blocky structure; very hard, very firm; common very fine and fine roots; common wedge-shaped peds; common prominent slickensides; few fine iron-manganese masses; slightly effervescent; moderately alkaline; gradual smooth boundary. (Combined thickness of the Bss horizons ranging from 27 to 60 inches)

Bkss—76 to 95 inches; brown (7.5YR 5/3) silty clay loam, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; very hard, firm; common very fine and fine roots; few wedge-shaped peds; few distinct slickensides; few fine iron-manganese masses; few films, common fine threads, and few fine and medium concretions of calcium carbonate; strongly effervescent; moderately alkaline. (10 to 40 inches thick)

Range in Characteristics

Thickness of the solum: More than 80 inches

Depth to aquic conditions: Less than 20 inches for some time in most years

Depth to slickensides: 6 to 20 inches

Cracks: 0.4 inch to 2 inches or more wide; extending from the surface to a depth of 40 inches or more during dry periods

Gilgai microrelief: Gilgai with microknolls 3 to 6 inches higher than microdepressions in most undisturbed areas; about 5 to 15 feet from the center of the microknolls to the center of the microdepressions

Depth to visible secondary calcium carbonates: More than 30 inches

Particle-size control section (weighted average):

Clay content—40 to 60 percent

CEC/clay ratio—more than 0.6

Ap and A horizons:

Color—hue of 10YR or 2.5Y, moist value of 2 or 3, and chroma of 2 or less

Texture—silty clay or clay

Clay content—40 to 60 percent

Concentrations—in some pedons, none; in other pedons, few or common fine iron-manganese concretions or masses

Calcium carbonate equivalent—0 to 2 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent or very slightly effervescent

Reaction—neutral to moderately alkaline

Bw horizon:

Color—hue of 10YR or 2.5Y, moist value of 2 or 3, and chroma of 2 or less

Texture—silty clay or clay

Clay content—40 to 60 percent

Concentrations—in some pedons, none; in other pedons, few or common fine iron-manganese concretions or masses

Calcium carbonate equivalent—0 to 2 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly alkaline or moderately alkaline

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Bss horizon:

Color—hue of 10YR or 2.5Y, moist value of 3 or 4 (4 or 5 dry), and chroma of 2 or less
Texture—silty clay or clay
Clay content—40 to 60 percent
Concentrations—in some pedons, none; in other pedons, few or common fine iron-manganese concretions or masses
Calcium carbonate equivalent—0 to 5 percent
Electrical conductivity (EC)—dS/m of 0 to 2
Effervescence—noneffervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Bkss, Bk, or BC horizon:

Color—hue of 7.5YR to 2.5Y, moist value of 3 to 6, and chroma of 1 to 4
Texture—clay loam, silty clay loam, silty clay, or clay
Clay content—30 to 60 percent
Concentrations—in some pedons, none; in other pedons, few or common fine iron-manganese concretions or masses
Redoximorphic features—in some pedons, none; in other pedons, few or common
Visible secondary carbonates—in most pedons few or common concretions and/or masses of calcium carbonate
Calcium carbonate equivalent—2 to 15 percent
Electrical conductivity (EC)—dS/m of 0 to 2
Gypsum content—0 to 2 percent
Effervescence—very slightly effervescent to strongly effervescent
Reaction—moderately alkaline

Eda Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Somewhat excessively drained

Parent material and geologic age: Sandy eolian sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Sand sheets

Position: Dunes and interdune areas

Slope: 0 to 15 percent

Mean annual precipitation: 22 to 32 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 52

Taxonomic classification: Mixed, thermic Lamellic Ustipsamments

Associated Soils

These are soils of the Carman, Carwile, Devol, Grandfield, Nobscot, and Tivoli series. Carman soils have a mollic epipedon and have a fine-loamy control section. The poorly drained, fine textured Carwile soils are in nearby depressions. Devol, Grandfield, and Nobscot soils are in the slightly less undulating areas. Devol soils have a coarse-loamy control section, Grandfield soils have a fine-loamy control section, and Nobscot soils have a coarse-loamy control section and have sandy

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surface soil more than 20 inches thick. Tivoli soils are on the steeper slopes and are characterized by restricted profile development.

Typical Pedon

Eda loamy fine sand, in an area of rangeland; Woods County, Oklahoma, about 5 miles east and 2 miles north of Waynoka; about 1,000 feet west and 550 feet south of the northeast corner of sec. 34, T. 25 N., R. 15 W.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 16 inches; brown (7.5YR 5/4), crushed, loamy fine sand, brown (7.5YR 4/4) crushed and moist; weak medium subangular blocky structure parting to single grained; loose, very friable, nonsticky, nonplastic; many fine roots throughout; slightly acid (pH 6.5); clear wavy boundary. (7 to 20 inches thick)
- E/Bt1—16 to 29 inches; reddish yellow (5YR 6/6), crushed, sand, yellowish red (5YR 5/6) crushed and moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, nonsticky, nonplastic; common fine and few medium roots throughout; few fine discontinuous tubular pores; red (2.5YR 4/6) lamellae, 2 to 10 millimeters thick and 2 to 12 centimeters apart, with texture of loamy fine sand having 2 to 3 percent more clay than the matrix; few distinct continuous clay bridges between sand grains; neutral (pH 6.8); gradual wavy boundary. (15 to 30 inches thick)
- E/Bt2—29 to 43 inches; reddish yellow (5YR 6/6), crushed, sand, yellowish red (5YR 5/6) crushed and moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, nonsticky, nonplastic; common fine, few medium, and few coarse roots throughout; few fine discontinuous tubular pores; red (2.5YR 4/6) lamellae, 2 to 10 millimeters thick and 14 to 20 centimeters apart, with texture of loamy fine sand having 2 to 3 percent more clay than the matrix; few distinct continuous clay bridges between sand grains; neutral (pH 7.0); gradual wavy boundary. (0 to 15 inches thick)
- C1—43 to 66 inches; reddish yellow (5YR 7/6) sand, reddish yellow (5YR 6/6) crushed and moist; single grained; very friable, nonsticky, nonplastic; few very fine and few coarse roots throughout; few discontinuous red (2.5YR 4/6) lamellae, less than 2 millimeters thick and 3 to 7 centimeters apart, with texture of loamy fine sand having 2 to 3 percent more clay than the matrix; sand grains coated with silicate clay but no bridging between the sand grains; slightly acid (pH 6.5); gradual wavy boundary. (20 to 55 inches thick)
- C2—66 to 88 inches; reddish yellow (7.5YR 6/6) sand, strong brown (7.5YR 5/6) crushed and moist; single grained; loose, very friable, nonsticky, nonplastic; few very fine roots throughout; some faint cross-bedding; neutral (pH 7.0).

Range in Characteristics

Thickness of the solum: 24 to 50 inches

Depth to secondary calcium carbonates: More than 40 inches

Total thickness of the lamellae that are 1 centimeter or more thick: Less than 15 centimeters

Clay content in the particle-size control section (weighted average): 1 to 8 percent; the illuvial horizons containing less than 3 percent more clay than the overlying eluvial horizon

A horizon:

Color—hue of 7.5YR or 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 1 to 6

Texture—sand, fine sand, loamy sand, or loamy fine sand

Clay content—1 to 7 percent

Effervescence—noneffervescent

Reaction—moderately acid to neutral

E/Bt horizon:

Color—hue of 5YR to 10YR, value of 4 to 7 (3 to 5 moist), and chroma of 2 to 8
Texture—sand, fine sand, loamy sand, or loamy fine sand
Clay content—1 to 8 percent
Effervescence—noneffervescent
Reaction—moderately acid to neutral

C horizon:

Color—hue of 7.5YR or 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 3 to 8
Texture—sand, loamy fine sand, or fine sand
Clay content—1 to 8 percent
Effervescence—noneffervescent or very slightly effervescent
Reaction—slightly acid or neutral

Ezell Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Very poorly drained

Flooding: Frequently flooded or occasionally flooded for very brief periods, mainly during the spring and summer months

Ponding: Occurring for long or very long periods, mainly during the winter and spring months

Parent material and geologic age: Calcareous, sandy alluvium of Recent age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: River valleys

Landform: Flood plains

Slope: 0 to 1 percent

Mean annual precipitation: 22 to 40 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 64

Taxonomic classification: Sandy, mixed, thermic Aeric Fluvaquents

Associated Soils

These are soils of the Gaddy, Gracemont, Gracemore, Jester, and Lincoln series. Gaddy, Jester, and Lincoln soils occur in the higher areas and do not have a water table within a depth of 60 inches. Gracemont and Gracemore are in landscape positions similar to those of the Ezell soils. They are somewhat poorly drained, do not have a water table within a depth of 12 inches, and are not ponded for long periods.

Typical Pedon

Ezell loam, in an area of rangeland; Woods County, Oklahoma; about 3 miles west of Waynoka; 200 feet south and 1,500 feet east of the northwest corner of sec. 5, T. 24 N., R. 16 W.

(Colors are for moist soil unless otherwise indicated.)

A—0 to 7 inches; very dark grayish brown (10YR 3/2), interior, loam, dark grayish brown (10YR 4/2), interior, dry; weak medium granular structure; slightly hard, friable; many very fine and fine and few medium roots throughout; few fine and medium faint grayish brown (10YR 5/2) irregular redoximorphic depletions;

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common yellowish red (5YR 5/6) redoximorphic accumulations; positive reaction to alpha,alpha-dipyridyl; electrical conductivity equivalent of 1.5 dS/m; sodium absorption ratio of 1.0; calcium carbonate equivalent of 19.0 percent; pockets of decomposed organic matter; strongly effervescent; moderately alkaline; clear smooth boundary. (6 to 12 inches thick)

- C1—7 to 48 inches; brown (7.5YR 5/4), interior, loamy fine sand, light brown (7.5YR 6/4), interior, dry; single grained; few medium and common very fine and fine roots throughout; common medium distinct strong brown (7.5YR 5/8) and common medium prominent dark red (2.5YR 3/6) redoximorphic accumulations; common fine distinct brown (7.5YR 4/2) and few fine prominent very dark grayish brown (2.5Y 3/2) redoximorphic depletions; electrical conductivity equivalent of 0.2 dS/m; 3.0 percent calcium carbonate equivalent of 3.0 percent; common fine irregular salt accumulations throughout; old root channels filled with salt crystals; slightly effervescent; moderately alkaline; clear smooth boundary. (7 to 41 inches thick)
- C2—48 to 80 inches; brown (7.5YR 4/4), interior, fine sand, brown (7.5YR 5/4), interior, dry; single grained; common fine faint dark grayish brown (10YR 4/2) irregular iron depletions; common fine pockets of clean sand; slightly effervescent; moderately alkaline.

Range in Characteristics

Depth to endosaturation: Fluctuates from 1 foot above to 1 foot below the surface during the year

Particle-size control section (weighted average):

Clay content—2 to 10 percent

Content of rock fragments—0 to 15 percent

A horizon:

Color—hue of 10YR or 2.5Y, moist value of 3 to 5, and chroma of 1 to 3

Texture—loam, fine sandy loam, or loamy sand

Clay content—2 to 25 percent

Concentrations—accumulations of salt or gypsum crystals in some pedons

Redoximorphic accumulations—few or common red to yellowish brown iron concentrations

Redoximorphic depletions—few or common grayish brown or gray iron depletions

Calcium carbonate equivalent—5 to 35 percent

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 30 percent

Sodium adsorption ratio (SAR)—0 to 5

Effervescence—slightly effervescent to violently effervescent

Reaction—slightly alkaline or moderately alkaline

C horizon:

Color—hue of 5YR to 10YR, moist value of 3 to 6, and chroma of 2 to 6

Texture—fine sand, loamy fine sand, or sand; stratified with finer textured material in some pedons

Clay content—2 to 10 percent

Redoximorphic accumulations—few or common accumulations in shades of red or brown

Redoximorphic depletions—few or common grayish brown or gray depletions

Content of rock fragments, by volume—0 to 15 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 5 percent

Electrical conductivity (EC)—dS/m of 0 to 4

Gypsum content—0 to 5 percent

Sodium adsorption ratio (SAR)—0 to 2
Effervescence—slightly effervescent or strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Farry Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy alluvium of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces

Position: Treads and risers

Slope: 0 to 15 percent

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, superactive, thermic Typic Argiustolls

Associated Soils

These are soils of the Abbie, Arnett, Fortyone, Madge, Quinlan, and Woodward series. Abbie soils occur on the higher ridgetops and contain more clay in the argillic horizon than the Farry soils. Arnett soils are in landscape positions similar to those of the Farry soils. They have an ochric epipedon and contain more gravel in the solum than the Farry soils. Fortyone soils occur on the lower side slopes, have an ochric epipedon, and are coarse-loamy in the particle-size control section. Madge soils occur on the lower footslopes and contain less than 3 percent rounded gravel in the particle-size control section. Quinlan and Woodward soils occur on the lower side slopes, have an ochric epipedon, and are less than 40 inches deep to sandstone bedrock.

Typical Pedon

Farry fine sandy loam, in an area of rangeland; Woods County, Oklahoma; about 12 miles north and 12 miles west of Freedom; 550 feet north and 1,350 feet east of the southwest corner of sec. 35, T. 29 N., R. 20 W.

(Colors are for dry soil unless otherwise indicated.)

A—0 to 12 inches; brown (7.5YR 4/3) fine sandy loam, dark brown (7.5YR 3/3) moist; moderate fine and medium granular structure; soft, very friable; common very fine and fine roots throughout; common very fine and fine low-continuity vesicular and tubular pores; common wormcasts; 1 percent rounded mixed gravel; neutral; clear smooth boundary. (7 to 14 inches thick)

Bt—12 to 21 inches; brown (7.5YR 4/4) sandy clay loam, dark brown (7.5YR 3/4) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; common very fine and fine roots throughout; common very fine and fine low-continuity vesicular and tubular and few medium discontinuous tubular pores; many distinct discontinuous clay films on faces of peds; common wormcasts; 3 percent rounded mixed gravel; slightly alkaline; clear smooth boundary. (7 to 36 inches thick)

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- Btk—21 to 35 inches; reddish brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; common very fine and fine roots throughout; common very fine and fine low-continuity vesicular and tubular and few medium discontinuous tubular pores; common distinct discontinuous clay films on faces of peds; few wormcasts; common fine and medium calcium carbonate threads; slightly effervescent; 4 percent rounded mixed gravel; moderately alkaline; clear smooth boundary. (8 to 29 inches thick)
- BCK—35 to 46 inches; yellowish red (5YR 5/6) coarse sandy loam, yellowish red (5YR 4/6) moist; moderate medium and coarse prismatic structure parting to weak medium subangular blocky; hard, friable; few very fine and fine roots throughout; common very fine low-continuity vesicular and tubular, few fine low-continuity vesicular and tubular, and few medium discontinuous tubular pores; few faint discontinuous calcium carbonate coatings on faces of peds; common fine and medium calcium carbonate threads; strongly effervescent; 5 percent rounded mixed gravel; moderately alkaline; gradual smooth boundary. (4 to 29 inches thick)
- C—46 to 80 inches; reddish yellow (5YR 6/6) loamy coarse sand, yellowish red (5YR 5/6) moist; strongly effervescent; 10 percent rounded mixed gravel; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to more than 60 inches

Depth to secondary calcium carbonates: 20 to more than 60 inches

Thickness of the mollic epipedon: 7 to 14 inches

Particle-size control section (weighted average):

Clay content—18 to 32 percent

Sand content—20 to 70 percent

Content of rock fragments—3 to 15 percent

CEC/clay ratio—more than 0.6

A horizon:

Color—hue of 5YR to 10YR, value of 4 or 5 (3 moist), and chroma of 2 or 3

Texture—sandy loam, fine sandy loam, or loam

Clay content—8 to 22 percent

Content of rock fragments, by volume—0 to 5 percent rounded gravel less than 3 inches in diameter

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

Upper part of the Bt horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—sandy clay loam, clay loam, or loam

Clay content—18 to 32 percent

Content of rock fragments, by volume—3 to 15 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 5 percent

Effervescence—typically noneffervescent, but may be slightly effervescent

Reaction—neutral to moderately alkaline

Lower part of the Bt horizon:

Color—hue of 2.5YR to 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 to 6

Texture—sandy clay loam, loam, or sandy loam

Clay content—18 to 27 percent

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Content of rock fragments, by volume—3 to 15 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 5 percent

Visible secondary carbonates—in some pedons, none; in other pedons, few or common threads or films

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

BC horizon:

Color—hue of 2.5YR to 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 to 8

Texture—sandy clay loam, loam, sandy loam, or loamy sand

Clay content—5 to 27 percent

Content of rock fragments, by volume—3 to 20 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 10 percent

Visible secondary carbonates—in some pedons, none; in other pedons, few or common threads or films

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

C horizon:

Color—hue of 5YR to 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 4 to 8

Texture—sandy loam, very fine sandy loam, loam, loamy sand, or sand; may be stratified

Clay content—3 to 20 percent

Content of rock fragments, by volume—3 to 25 percent rounded gravel less than 3 inches in diameter; 60 percent or more in some thin strata

Calcium carbonate equivalent—0 to 10 percent

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

Frankirk Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy alluvial sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces

Position: Treads

Slope: 0 to 5 percent

Mean annual precipitation: 21 to 27 inches

Mean annual air temperature: 57 to 65 degrees F

Thornthwaite PE index: 31 to 44

Taxonomic classification: Fine, mixed, superactive, thermic Typic Argiustolls

Associated Soils

These are soils of the Abilene, Aspermont, Bukreek, Grandfield, Miles, and Roark series. Abilene and Roark soils have a mollic epipedon that is more than 20 inches thick. Aspermont soils do not have a mollic epipedon or an argillic horizon and are in

the higher landscape positions. Bukreek, Grandfield, and Miles soils have less than 35 percent clay in the argillic horizon and are in landscape positions similar to those of the Frankirk soils.

Typical Pedon

Frankirk clay loam, in an area of cropland; Stonewall County, Texas; from the intersection of U.S. Highway 380 and Farm Road 1835 about 0.1 mile north of the Post Office in Old Glory, 2.6 miles east on a county road and 100 feet north in a cultivated field.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 7 inches; reddish brown (5YR 5/3) clay loam, dark reddish brown (5YR 3/3) moist; weak fine granular structure; slightly hard, friable; neutral; abrupt smooth boundary. (5 to 9 inches thick)
- Bt1—7 to 16 inches; reddish brown (5YR 4/3) clay loam, dark reddish brown (2.5YR 3/3) moist; weak coarse prismatic structure parting to moderate medium angular blocky; hard, firm; many distinct clay films; slightly alkaline; gradual smooth boundary. (5 to 11 inches thick)
- Bt2—16 to 35 inches; reddish brown (2.5YR 4/4) clay, dark reddish brown (2.5YR 3/4) moist; weak coarse prismatic structure parting to moderate medium angular blocky; hard, firm; many distinct clay films; slightly alkaline; gradual smooth boundary. (15 to 24 inches thick)
- Bt3—35 to 48 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) moist; moderate medium subangular blocky structure; hard, friable; many distinct clay films; slightly effervescent; moderately alkaline; diffuse smooth boundary. (8 to 20 inches thick)
- Btk—48 to 64 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; hard, friable; few distinct clay films; about 2 percent, by volume, calcium carbonate concretions; strongly effervescent; moderately alkaline; gradual smooth boundary. (0 to 18 inches thick)
- Bk—64 to 85 inches; reddish yellow (5YR 6/6) sandy clay loam, yellowish red (5YR 5/6) moist; weak fine granular structure; hard, friable; about 5 percent, by volume, calcium carbonate concretions; strongly effervescent; moderately alkaline; diffuse smooth boundary. (12 to 25 inches thick)
- C—85 to 100 inches; yellowish red (5YR 5/6) loam, yellowish red (5YR 4/6) moist; massive; hard, friable; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to secondary calcium carbonates: 29 to 48 inches

Depth to a calcic horizon (where present): More than 40 inches

Thickness of the mollic epipedon: 10 to 20 inches

Particle-size control section (weighted average):

Clay content—35 to 45 percent

Content of rock fragments—0 to 3 percent

CEC/clay ratio—more than 0.6

A horizon:

Color—hue of 5YR or 7.5YR, value of 3 to 5 (2 or 3 moist), and chroma of 2 or 3

Texture—loam, sandy clay loam, or clay loam

Clay content—18 to 35 percent

Content of rock fragments, by volume—0 to 3 percent rounded gravel less than 3 inches in diameter

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Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent

Reaction—neutral or slightly alkaline

Bt1 horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3

Texture—sandy clay loam, clay loam, or clay

Clay content—27 to 45 percent

Content of rock fragments, by volume—0 to 3 percent rounded gravel less than 3 inches in diameter

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent

Reaction—neutral to moderately alkaline

Lower Bt horizons:

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 or 6

Texture—clay loam, sandy clay, or clay

Clay content—35 to 45 percent

Content of rock fragments, by volume—0 to 3 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 10 percent

Visible secondary carbonates—in some pedons, none; in other pedons, few or common fine or medium concretions, masses, or threads

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

Bk horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6

Texture—loam, clay loam, or sandy clay loam

Clay content—20 to 30 percent

Content of rock fragments, by volume—0 to 10 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—5 to 20 percent

Visible secondary carbonates—common fine or medium concretions, masses, or threads

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—strongly effervescent or violently effervescent

Reaction—moderately alkaline

C horizon:

Color—hue of 2.5YR or 5YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 or 6

Texture—loam, clay loam, or sandy clay loam

Clay content—20 to 30 percent

Content of rock fragments, by volume—0 to 10 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—2 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline

Gracemont Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C); Central Rolling Red Prairies (80A)

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Depth class: Very deep

Drainage class: Somewhat poorly drained

Flooding: Frequently flooded or occasionally flooded for very brief periods, mainly during the spring and summer months

Parent material and geologic age: Calcareous, sandy and loamy alluvium of Recent age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: River valleys

Landform: Flood plains

Slope: 0 to 2 percent

Mean annual precipitation: 22 to 38 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 64

Taxonomic classification: Coarse-loamy, mixed, superactive, calcareous, thermic Oxyaquic Udifluvents

Associated Soils

These are soils of the Clairemont, Gracemore, Lincoln, Pulaski, Westola, and Yahola series. Clairemont soils have a fine-silty control section and do not have a water table within 40 inches of the surface. Gracemore soils have a sandy control section and generally are closer to stream channels than the Clairemont soils. Lincoln, Pulaski, Westola, and Yahola soils generally are in the slightly higher areas and do not have a water table within 40 inches of the surface.

Typical Pedon

Gracemont fine sandy loam, in an area of pasture; Caddo County, Oklahoma; 1 mile north of Gracemont; 855 feet north and 2,550 feet west of the southeast corner of sec. 33, T. 9 N., R. 10 W.

(Colors are for moist soil unless otherwise indicated.)

A—0 to 14 inches; dark reddish brown (5YR 3/4) fine sandy loam; weak fine granular structure; slightly hard, very friable; calcareous; moderately alkaline; clear smooth boundary. (6 to 18 inches thick)

C1—14 to 34 inches; dark red (2.5YR 3/6) fine sandy loam; massive; slightly hard, friable; strata of darker loam as much as 3 inches thick, separated from the mass by evident bedding planes; a few soft masses of calcium carbonate; calcareous; moderately alkaline; water table at a depth of 24 inches; clear smooth boundary. (10 to 30 inches thick)

C2—34 to 46 inches; dark reddish brown (5YR 3/4) fine sandy loam; massive; very friable; highly stratified with browner material; common soft masses of calcium carbonate; calcareous; moderately alkaline; clear smooth boundary. (10 to 20 inches thick)

Ab—46 to 64 inches; very dark brown (10YR 2/2) loam; massive; friable; common soft masses of calcium carbonate; calcareous; moderately alkaline.

Range in Characteristics

Depth to secondary calcium carbonates: 0 to 10 inches

Depth to endosaturation: 6 to 40 inches from November through May in most years

Particle-size control section (weighted average):

Clay content—10 to 18 percent

Content of rock fragments—0 to 2 percent

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CEC/clay ratio—more than 0.6

A horizon:

Color—hue of 2.5YR to 10YR, value of 3 to 5 (4 to 6 dry), and chroma of 2 to 6;
horizon thickness of less than 10 inches where moist value and chroma are
less than 3.5

Texture—loamy fine sand, fine sandy loam, or loam

Clay content—5 to 35 percent

Calcium carbonate equivalent—0 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 16

Content of gypsum—0 to 5 percent

Sodium adsorption ratio (SAR)—0 to 6

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

C horizon:

Color—hue of 2.5YR to 10YR, value of 3 to 6 (4 to 7 dry), and chroma of 2 to 8

Texture—fine sandy loam, very fine sandy loam, or loam with thin strata of
coarser or finer textured material

Clay content—10 to 18 percent

Calcium carbonate equivalent—1 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 16

Content of gypsum—0 to 5 percent

Sodium adsorption ratio (SAR)—0 to 6

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline

Ab horizon (where present):

Color—hue of 5YR to 10YR, value of 2 to 4 (3 to 5 dry), and chroma of 1 to 4

Texture—loam, clay loam, or fine sandy loam

Clay content—10 to 32 percent

Calcium carbonate equivalent—1 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 16

Content of gypsum—0 to 5 percent

Sodium adsorption ratio (SAR)—0 to 6

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline

Gracemore Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central
Rolling Red Plains, Eastern Part (78C); Central Rolling Red Prairies (80A)

Depth class: Very deep

Drainage class: Somewhat poorly drained

Flooding: Frequently flooded or occasionally flooded for very brief periods, mainly
during the spring and summer months

Parent material and geologic age: Calcareous, sandy alluvium of Recent age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: River valleys

Landform: Flood plains

Slope: 0 to 2 percent

Mean annual precipitation: 22 to 38 inches

Mean annual air temperature: 57 to 64 degrees F

Thorntwaite PE index: 32 to 64

Taxonomic classification: Sandy, mixed, thermic Oxyaquic Udifluvents

Associated Soils

These are soils of the Daycreek, Ezell, Gaddy, Gracemont, Goodnight, Heman, Jester, Lincoln, Port, Westola, and Yahola series. Daycreek soils do not have an irregular distribution of organic matter and are in the higher areas. Ezell soils are ponded for long periods and are in landscape positions similar to those of the Gracemont soils. Gaddy and Lincoln soils do not have a water table within 40 inches of the surface and are in the slightly higher areas. Gracemont soils are in landscape positions similar to those of the Gracemont soils. They have a coarse-loamy control section. Goodnight and Jester soils do not have an irregular distribution of organic matter and are on dunes. Heman soils have a strongly contrasting particle-size textural control section. Port soils have a mollic epipedon and a fine-silty control section and do not have a water table within 40 inches of the surface. Westola and Yahola soils have a coarse-loamy control section, do not have a water table within 40 inches of the surface, and are in the slightly higher areas.

Typical Pedon

Gracemont loamy fine sand, in an area of rangeland; Canadian County, Oklahoma; about 12 miles west and 6 miles south of El Reno; 600 feet north and 300 feet west of the southeast corner of sec. 5, T. 11 N., R. 9 W.

(Colors are for moist soil unless otherwise indicated.)

- A—0 to 12 inches; brown (7.5YR 4/4) loamy fine sand, brown (7.5YR 5/4) dry; weak fine granular structure; soft, very friable; many fine roots; slightly effervescent; moderately alkaline; clear smooth boundary. (6 to 18 inches thick)
- C—12 to 72 inches; brown (7.5YR 5/4) fine sand, pink (7.5YR 7/4) dry; single grained; loose, very friable; very thin to 1-inch strata of darker fine sandy loam, loam, or clay loam that decrease in number as depth increases; bedding planes are evident; slightly effervescent; moderately alkaline.

Range in Characteristics

Depth to secondary calcium carbonates: 0 to 10 inches

Depth to endosaturation: 6 to 40 inches from November through May in most years

Particle-size control section (weighted average):

Clay content—2 to 10 percent

Content of rock fragments—0 to 10 percent

A horizon:

Color—hue of 5YR to 10YR, value of 3 to 8 (4 to 8 dry), and chroma of 1 to 6; horizon thickness of less than 10 inches where moist value and chroma are less than 3.5

Texture—in the upper 10 inches, fine sand, loamy fine sand, fine sandy loam, very fine sandy loam, loam, silty clay loam, or clay loam; below a depth of 10 inches, loamy fine sand or fine sand

Clay content—2 to 35 percent

Content of rock fragments, by volume—0 to 10 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 16

Content of gypsum—0 to 5 percent

Sodium adsorption ratio (SAR)—0 to 6

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Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

C horizon:

Color—hue of 5YR to 10YR, value of 4 to 7 (5 to 8 dry), and chroma of 2 to 6

Texture—loamy fine sand, fine sand, or sand with strata that are fine sandy loam to clay loam, generally are less than 1 inch thick, and are darker and contain more organic matter than the mass of the horizon

Clay content—2 to 10 percent

Content of rock fragments, by volume—0 to 10 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—1 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 16

Content of gypsum—0 to 5 percent

Sodium adsorption ratio (SAR)—0 to 6

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline

Grandfield Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, loamy and sandy alluvial and eolian sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Sand sheets

Position: Hummocks or dunes

Slope: 0 to 15 percent

Mean annual precipitation: 22 to 32 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, superactive, thermic Typic Haplustalfs

Associated Soils

These are soils of the Altus, Devol, Eda, Grandmore, Nobscot, and Tipton series. Altus and Tipton soils are in the adjacent slightly concave areas and have a mollic epipedon. Devol and Eda soils are on the slightly higher ridges. Eda soils have a sandy control section. Grandmore soils are in landscape positions similar to those of the Grandfield soils or in slightly lower areas, are moderately well drained, and have a discontinuity with a clay increase in the lower part of the solum. Nobscot soils are on the slightly higher ridges and have sandy A horizons more than 20 inches thick.

Typical Pedon

Grandfield fine sandy loam, in a cultivated area; Tillman County, Oklahoma; about 3 miles west and 1 mile north of Frederick; 200 feet south and 400 feet east of the northwest corner of NE¹/₄ sec. 10, T. 2 S., R. 18 W.

(Colors are for dry soil unless otherwise indicated.)

Soil Survey of Jackson County, Oklahoma

- Ap—0 to 6 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak fine granular structure; slightly hard, friable; neutral; abrupt smooth boundary. (5 to 9 inches thick)
- A—6 to 10 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; moderate fine granular structure; slightly hard, friable; few fine pores; neutral; gradual smooth boundary. (0 to 14 inches thick)
- BA—10 to 18 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; weak coarse prismatic structure; hard, friable; few fine pores; neutral; gradual smooth boundary. (0 to 12 inches thick)
- Bt1—18 to 28 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, friable; few medium pores; thin discontinuous clay films on faces of peds; slightly alkaline; gradual smooth boundary. (6 to 18 inches thick)
- Bt2—28 to 48 inches; reddish brown (2.5YR 5/4) sandy clay loam, reddish brown (2.5YR 4/4) moist; weak medium subangular blocky structure; hard, friable; few very fine pores; discontinuous clay films on faces of peds; slightly alkaline; gradual smooth boundary. (16 to 22 inches thick)
- Bck—48 to 80 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure; hard, friable; few very fine pores; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: More than 50 inches

Depth to secondary calcium carbonates: More than 30 inches

Particle-size control section (weighted average):

Clay content—18 to 30 percent

Content of rock fragments—0 to 2 percent

CEC/clay ratio—more than 0.6

Ap and A horizons:

Color—hue of 5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 4

Texture—fine sandy loam, loamy fine sand or loamy sand

Clay content—5 to 18 percent

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

BA horizon and the upper part of the Bt horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 to 6

Texture—fine sandy loam or sandy clay loam

Clay content—18 to 30 percent

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

Lower part of the Bt horizon and the BC horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 to 8

Texture—fine sandy loam, sandy clay loam, or clay loam

Clay content—10 to 30 percent

Calcium carbonate equivalent—0 to 5 percent

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

C horizon (where present):

Color—hue of 2.5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 to 8

Texture—fine sandy loam, loamy fine sand, loamy sand, or sand; in some

pedons, stratified with coarser or finer textured material occurring as thin, widely spaced lamellae
Clay content—5 to 20 percent
Calcium carbonate equivalent—0 to 5 percent
Effervescence—noneffervescent to strongly effervescent
Reaction—neutral to moderately alkaline

Grandmore Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Moderately well drained

Parent material and geologic age: Loamy alluvial and eolian sediments over more clayey alluvium of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Sand sheets

Position: Hummocks or interdune areas

Slope: 0 to 3 percent

Mean annual precipitation: 22 to 32 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, active, thermic Typic Haplustalfs

Associated Soils

These are soils of the Altus, Devol, Grandfield, Headrick, and McKnight series. Altus soils are in landscape positions similar to those of the Grandmore soils. They have a mollic epipedon and are less clayey in the lower part of the solum than the Grandmore soils. Devol soils occur on the higher ridges and have a coarse-loamy textural control section. Grandfield and McKnight soils occur in broad, convex areas on the slightly higher parts of the landscape. Headrick soils occur in broad, plane or concave areas on the slightly lower parts of the landscape and have a perched water table within 40 inches of the surface.

Typical Pedon

Grandmore loamy fine sand, on a slope of 2 percent in a cultivated field; Harmon County, Oklahoma; from the intersection of U.S. Highway 62 and Oklahoma State Highway 30 in Hollis, about 9 miles north on Highway 30, about 4.25 miles west on a county road, and about 1,700 feet north in cropland at an elevation of 1,925 feet; 1,680 feet north and 1,300 feet west of the southeast corner of sec. 13, T. 4 N., R. 27 W.; latitude—34 degrees, 49 minutes, 1.25 seconds N; longitude—99 degrees, 59 minutes, 12 seconds W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 10 inches; brown (7.5YR 5/4) loamy fine sand, brown (7.5YR 4/4) moist; weak medium granular structure; soft, very friable; common very fine and fine roots; neutral; abrupt smooth boundary. (5 to 19 inches thick)

Bt1—10 to 23 inches; reddish brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; common very fine and fine roots; common

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distinct clay films on faces of peds and in pores; slightly alkaline; gradual smooth boundary.

Bt2—23 to 40 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; few very fine and fine roots; common distinct clay films on faces of peds and in pores; slightly alkaline; gradual smooth boundary.

Bt3—40 to 52 inches; reddish yellow (5YR 6/8) sandy clay loam, yellowish red (5YR 5/6) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; few very fine and fine roots; few faint clay films on faces of peds and in pores and common clay bridges between sand grains; few medium prominent light gray (10YR 7/2) and few medium distinct reddish brown (5YR 4/4) iron depletions; slightly alkaline; clear smooth boundary.
(Combined thickness of the Bt horizons ranging from 10 to 45 inches)

2Btb—52 to 80 inches; reddish brown (5YR 5/4) clay loam, reddish brown (5YR 4/4) moist; moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; very hard, very firm; few very fine and fine roots; 35 percent clay; many prominent clay films on faces of peds and in pores; common fine and medium iron-manganese masses; 1 percent rounded quartzite gravel; common medium and coarse prominent light gray (10YR 7/1) iron depletions; common medium prominent yellowish brown (10YR 5/6), common medium and coarse distinct light reddish brown (5YR 6/4), and common medium and coarse faint yellowish red (5YR 5/6) (moist) iron concentrations; slightly alkaline. (11 to 50 inches thick)

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to a discontinuity (with an increase in clay content): 30 to 60 inches

Depth to episaturation: 40 to 60 inches

Particle-size control section (weighted average):

Clay content—18 to 35 percent

Content of rock fragments—0 to 2 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 5YR to 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 2 to 4

Texture—fine sandy loam, loamy fine sand, or loamy sand

Clay content—3 to 18 percent

Effervescence—noneffervescent

Reaction—slightly acid to moderately alkaline

Bt horizon:

Color—hue of 5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6

Texture—sandy clay loam, loam, or fine sandy loam

Clay content—15 to 30 percent

Redoximorphic features—in some pedons, few or common fine or medium iron depletions or concentrations in shades of gray, brown, red, or yellow in the lower part of the horizon

Effervescence—noneffervescent

Reaction—neutral to moderately alkaline

BC horizon (where present):

Color, texture, and reaction—similar to those in the Bt horizon

2Btb horizon:

Color—hue of 5YR to 10YR, value of 4 to 7 (3 to 6 moist), and chroma of 1 to 4

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Texture—clay loam or clay

Clay content—30 to 45 percent

Concentrations—in some pedons, none; in other pedons, few or common fine or medium iron-manganese masses or concretions

Redoximorphic features—in most pedons, few or common fine or medium iron depletions or concentrations in shades of gray, brown, red, or yellow

Calcium carbonate equivalent—0 to 10 percent

Visible secondary carbonates—in some pedons, none; in other pedons, few or common fine or medium masses or concretions

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

2BCb horizon:

Color—hue of 5YR to 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 1 to 4

Texture—clay, clay loam, sandy clay loam, fine sandy loam, or loamy fine sand

Clay content—27 to 45 percent

Concentrations—in some pedons, none; in other pedons, few or common fine or medium iron-manganese masses or concretions

Redoximorphic features—in most pedons, few or common fine or medium iron depletions or concentrations in shades of gray, brown, red, or yellow

Calcium carbonate equivalent—0 to 15 percent

Visible secondary carbonates—in some pedons, none; in other pedons, few or common fine or medium masses or concretions

Effervescence—noneffervescent to strongly effervescent

Reaction—moderately alkaline

Hardeman Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material: Moderately coarse textured eolian and alluvial sediments

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: River valleys

Landform: Stream terraces

Position: Treads and risers

Slope: 0 to 20 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Coarse-loamy, mixed, superactive, thermic Typic Haplustepts

Associated Soils

These are soils of the Arnett, Deepwood, Devol, Enterprise, Grandfield, Hilgrave, Jester, Miles, Quinlan, Shrewder, Springer, Tivoli, and Woodward series. Arnett, Devol, Grandfield, Hilgrave, Miles, and Springer soils have an argillic horizon and are on the higher parts of the landscape. In addition, Arnett, Grandfield, Hilgrave, and Miles soils have more than 18 percent clay in the argillic horizon. Deepwood, Enterprise, and Woodward soils have a coarse-silty control section and are in landscape positions similar to those of the Hardeman soils. Jester and Tivoli soils are

sandy throughout and do not have a B horizon. Quinlan soils have bedrock at a depth of less than 20 inches and are in the higher landscape positions. Shrewder soils do not have secondary calcium carbonates within a depth of 28 inches and are in landscape positions similar to those of the Hardeman soils.

Typical Pedon

Hardeman fine sandy loam (fig. 6), in an area of cropland; Hardeman County, Texas; from the intersection of U.S. Highway 287 and Farm Road 680 about 0.6 mile west of Goodlett, 11.5 miles north, 3 miles west, and 3.8 miles north on Farm Road 680 and 100 feet west in a cultivated field.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 10 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable; common fine roots; slightly alkaline; clear smooth boundary. (0 to 12 inches thick)

Bw—10 to 18 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; compound weak medium subangular blocky and granular structure; slightly hard, very friable; few fine roots; few fine pores; slightly effervescent; moderately alkaline; clear smooth boundary. (8 to 18 inches thick)

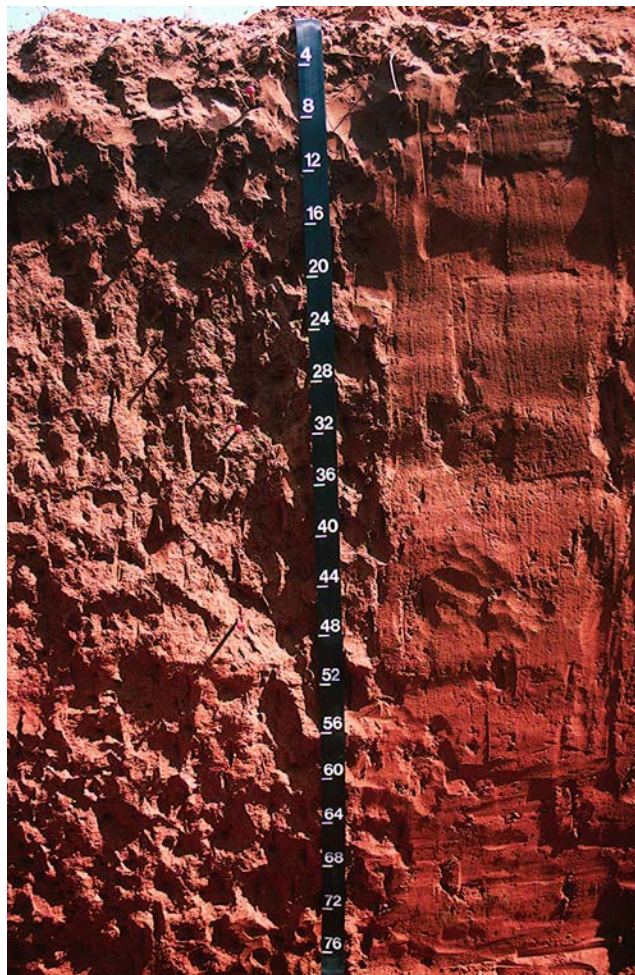


Figure 6.—Profile of Hardeman fine sandy loam, which exhibits weak horizonation and development.

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Bk1—18 to 36 inches; reddish brown (5YR 5/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; compound weak coarse prismatic and medium subangular blocky structure; slightly hard, very friable; few fine roots; few fine pores; many films and threads of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary. (12 to 30 inches thick)

Bk2—36 to 64 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure; slightly hard, very friable; few fine pores; few faint films and threads of calcium carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to secondary calcium carbonates: 0 to 28 inches

Particle-size control section (weighted average):

Clay content—12 to 18 percent

Content of rock fragments—0 to 10 percent

CEC/clay ratio—0.6 or more

A horizon:

Color—hue of 5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 4; horizon thickness of less than 10 inches where moist value and chroma are 3 or less

Texture—loam, fine sandy loam, sandy loam, or very fine sandy loam

Content of rock fragments, by volume—0 to 10 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 5 percent

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral to moderately alkaline

Bw horizon:

Color—hue of 5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—fine sandy loam, loam, sandy loam, or very fine sandy loam

Content of rock fragments, by volume—0 to 10 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 10 percent

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral to moderately alkaline

Bk1 horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 7 (3 to 6 moist), and chroma of 4 or 6

Texture—fine sandy loam, loam, sandy loam, or very fine sandy loam

Content of rock fragments, by volume—0 to 10 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—2 to 15 percent

Visible secondary carbonates—ranging from barely visible films and threads to about 5 percent soft masses

Effervescence—slightly effervescent or strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Bk2 horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 7 (3 to 6 moist), and chroma of 4 to 8

Texture—fine sandy loam, loam, or sandy loam

Content of rock fragments, by volume—0 to 10 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—2 to 15 percent

Visible secondary carbonates—ranging from barely visible films and threads to about 5 percent soft masses

Effervescence—slightly effervescent or strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Some pedons have a buried layer of sandy clay loam, sandy loam, or loamy sand below a depth of 40 inches.

Harmon Series

Major land resource area: Central Rolling Red Plains, Western Part (78B)

Depth class: Very shallow or shallow

Drainage class: Well drained

Parent material and geologic age: Thin layers of fractured dolomite limestone over shale and siltstone of the Blaine Formation of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Karstland

Landform: Hills

Position: Interfluves

Slope: 1 to 8 percent

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Thornthwaite PE index: 32 to 40

Taxonomic classification: Loamy-skeletal, carbonatic, thermic, shallow Typic Ustorthents

Associated Soils

These are soils of the Aspermont, Cottonwood, La Casa, Nipsum, and Talpa series. Aspermont, La Casa, and Nipsum soils are deep or very deep to Permian-age red-bed sediments and are in the lower landscape positions. Cottonwood soils are very shallow to gypsum and are in landscape positions similar to those of the Harmon soils. Talpa soils are in landscape positions similar to those of the Harmon soils. They have a mollic epipedon and a lithic contact. Sinkholes are a common feature of the karst topography.

Typical Pedon

Harmon gravelly silt loam, on a slope of 5 percent in an area of cropland; Jackson County, Oklahoma; from the intersection of Oklahoma State Highway 34 and U.S. Highway 62 in Duke, about 2.5 miles south on Highway 34, about 2.75 miles west on a county road, and 550 feet north in a cultivated field; 1,350 feet east and 550 feet north of the southwest corner of sec. 22, T. 2 N., R. 23 W.; USGS quadrangle—Prairie Hill; latitude—34 degrees, 37 minutes, 28 seconds N.; longitude—99 degrees, 33 minutes, 34 seconds W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 7 inches; light reddish brown (5YR 6/3) gravelly silt loam, reddish brown (5YR 5/3) moist; moderate fine and medium granular structure; few very fine and fine roots; common very fine and fine pores; common fine carbonate concretions; 60 percent calcium carbonate equivalent; 30 percent angular dolomite gravel; violently effervescent; moderately alkaline; abrupt smooth boundary. (4 to 9 inches thick)

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- ACk—7 to 16 inches; light brown (7.5YR 6/4) very gravelly silt loam, brown (7.5YR 5/4) moist; massive; very few very fine and fine roots; common very fine and fine and few medium pores; common fine carbonate concretions; 80 percent calcium carbonate equivalent; 56 percent angular dolomite gravel; violently effervescent; moderately alkaline; abrupt smooth boundary. (0 to 11 inches thick)
- Cr1—16 to 21 inches; light gray (10YR 7/1), partially weathered, fractured dolomite bedrock; violently effervescent; moderately alkaline; abrupt smooth boundary. (0 to 16 inches thick)
- Cr2—21 to 30 inches; 28 percent pale yellow (5Y 7/4), 28 percent light greenish gray (5GY 7/1), 28 percent light red (2.5YR 7/8), and 16 percent brown (10YR 5/3), interbedded claystone and siltstone bedrock; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 6 to 18 inches

Depth to paralithic contact: 6 to 18 inches

A horizon:

Color—hue of 5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 or 4

Texture—silt loam or loam

Content of rock fragments, by volume—35 to 65 percent rock fragments, consisting mainly of dolomite but also including claystone, siltstone, and gypsum parafragments in some pedons

Calcium carbonate equivalent—40 to more than 65 percent in the soil fraction less than 20 millimeters in size

Visible secondary carbonates—1 to 25 percent concretions

Effervescence—slightly effervescent to violently effervescent

Reaction—moderately alkaline

ACk horizon (where present):

Color—hue of 5YR to 10YR, value of 5 or 7 (4 or 6 moist), and chroma of 3 or 4

Texture—silt loam or loam

Content of rock fragments, by volume—35 to 65 percent rock fragments, consisting mainly of dolomite but also including claystone, siltstone, and gypsum parafragments in some pedons

Calcium carbonate equivalent—55 to 85 percent

Visible secondary carbonates—5 to 30 percent soft masses and concretions

Effervescence—violently effervescent

Reaction—moderately alkaline

Cr1 horizon:

Color—hue of 2.5Y or 5Y, value of 7 or 8 (6 or 7 moist), and chroma of 1 or 2

Kind of rock—partially weathered, fractured dolomitic limestone

Space between fractures—4 to more than 10 inches

Moist bulk density (g/cc)—1.85 to 2.35

Excavation difficulty—high or very high

Cr2 horizon:

Color—hue of 2.5YR to 5GY, value of 4 to 7 (3 to 6 moist), and chroma of 1 to 6

Kind of rock—interbedded claystone and siltstone

Headrick Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

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Drainage class: Somewhat poorly drained

Parent material and geologic age: Sandy eolian and loamy alluvial sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Sand sheets

Position: Flats

Slope: 0 to 1 percent

Mean annual precipitation: 22 to 32 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, active, thermic Oxyaquic Haplustalfs

Associated Soils

These are soils of the Devol, Eda, Grandfield, Grandmore, and McKnight series. Devol and Eda soils occur on the higher ridges. Devol soils have a coarse-loamy particle-size control section, and Eda soils have a sandy particle-size control section. Grandfield and McKnight soils are in broad, convex or hummocky areas on the slightly higher parts of the landscape. Grandmore soils are in slightly convex to hummocky interdune areas. They are in positions similar to or slightly higher than those of the Headrick soils.

Typical Pedon

Headrick loamy sand (fig. 7), on a slope of 0.2 percent in an area of cropland; Jackson County, Oklahoma; from the intersection of U.S. Highways 283 and 62 in Altus, 13 miles east on Highway 62, about 2.45 miles north on a county road, and 3,000 feet east in cropland; 2,400 feet north and 3,000 feet east of the southwest corner of sec. 4, T. 2 N., R. 18 W.; latitude—34 degrees, 40 minutes, 25 seconds N.; longitude—99 degrees, 5 minutes, 44 seconds W.; USGS quadrangle—Long Mountain; NAD 1927.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 5 inches; light brown (7.5YR 6/3) loamy sand, brown (7.5YR 4/3) moist; weak fine and medium granular structure; soft, friable; common very fine and fine and few medium roots; noneffervescent; slightly acid; abrupt smooth boundary. (5 to 19 inches thick)

Bt—5 to 32 inches; reddish brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; common very fine and fine roots; common distinct clay films on faces of peds; noneffervescent; neutral; clear wavy boundary. (15 to 50 inches thick)

2Btb—32 to 52 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; few very fine and fine roots; many distinct clay films on faces of peds; very slightly effervescent; moderately alkaline; gradual smooth boundary.

2Btkb—52 to 66 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; few very fine and fine roots; common faint clay films on faces of peds; common fine and medium iron-manganese masses; common fine and medium threads of calcium carbonate; strongly effervescent; moderately



Figure 7.—Profile of Headrick loamy sand, which is saturated with water below a depth of about 2.5 feet. The left side of the scale is in centimeters times 10; the right side is in feet.

alkaline; gradual smooth boundary. (Combined thickness of the 2Btb horizons ranging from 15 to 40 inches)

2BCkb—66 to 85 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; moderate medium and coarse prismatic structure; very hard, firm; few very fine and fine roots; common fine and medium threads of calcium carbonate; common fine and medium strong brown (7.5YR 4/6) and common fine and medium brown (7.5YR 5/3) iron accumulations; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to a discontinuity: 30 to 60 inches

Depth to secondary calcium carbonates: 30 to more than 60 inches

Depth to redoximorphic concentrations, where present: 20 to 40 inches

Depth to episaturation: 20 to 40 inches

Particle-size control section (weighted average):

Clay content—18 to 35 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 7.5YR or 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 or 4

Texture—loamy sand, loamy fine sand, or fine sandy loam

Effervescence—noneffervescent

Reaction—slightly acid to moderately alkaline

Bt horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6

Texture—sandy clay loam or fine sandy loam

Clay content—15 to 30 percent

Redoximorphic accumulations—in some pedons, none; in other pedons, few or common fine or medium, faint or distinct accumulations in shades of red or yellow

Redoximorphic depletions—in some pedons, none; in other pedons, few or common fine or medium, distinct or prominent depletions in shades of brown; in shades of gray below a depth of 30 inches

Iron-manganese accumulations—0 to 5 percent fine or medium masses or concretions

Calcium carbonate equivalent—0 to 3 percent

Visible secondary carbonates—0 to 3 percent fine or medium concretions or masses

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral to moderately alkaline

BC horizon (where present):

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6

Texture—sandy clay loam or fine sandy loam

Clay content—15 to 30 percent

Redoximorphic accumulations—in some pedons, none; in other pedons, few or common fine or medium, faint or distinct accumulations in shades of red or yellow

Redoximorphic depletions—in some pedons, none; in other pedons, few or common fine or medium, distinct or prominent depletions in shades of brown; in shades of gray below a depth of 30 inches

Iron-manganese accumulations—0 to 5 percent fine or medium masses or concretions

Calcium carbonate equivalent—0 to 3 percent

Visible secondary carbonates—0 to 3 percent fine or medium concretions or masses

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral to moderately alkaline

2Btb horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6

Texture—clay loam or clay

Soil Survey of Jackson County, Oklahoma

Clay content—30 to 50 percent
Redoximorphic accumulations—in some pedons, none; in other pedons, few or common fine or medium accumulations in shades of red or yellow
Redoximorphic depletions—in some pedons, none; in other pedons, few or common fine or medium, faint or distinct depletions in shades of gray or brown
Iron-manganese accumulations—0 to 5 percent fine or medium masses or concretions
Content of rock fragments, by volume—0 to 5 percent rounded quartzite gravel
Calcium carbonate equivalent—1 to 15 percent
Visible secondary carbonates—0 to 5 percent fine or medium concretions, masses, or threads
Gypsum content—0 to 5 percent
Effervescence—noneffervescent to strongly effervescent
Reaction—neutral to moderately alkaline

2BCkb horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6
Texture—clay loam, sandy clay loam, silty clay loam, silty clay, or clay
Clay content—30 to 50 percent
Redoximorphic accumulations—few or common fine or medium accumulations in shades of red or yellow
Redoximorphic depletions—few or common fine or medium, faint or distinct depletions in shades of gray or brown
Iron-manganese accumulations—0 to 5 percent fine or medium masses or concretions
Content of rock fragments, by volume—0 to 5 percent rounded quartzite gravel
Calcium carbonate equivalent—1 to 15 percent
Visible secondary carbonates—0 to 5 percent fine or medium concretions, masses, or threads
Gypsum content—0 to 5 percent
Effervescence—very slightly effervescent to strongly effervescent
Reaction—moderately alkaline

3C horizon (where present):

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 or 6
Texture—clay loam, silty clay loam, silty clay, or clay (Permian red-bed sediments)
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

Heatly Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy and sandy eolian material of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Sand sheets

Position: Hummocks

Slope: 0 to 5 percent

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Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 59 to 68 degrees F

Thornthwaite PE index: 31 to 40

Taxonomic classification: Loamy, mixed, active, thermic Arenic Paleustalfs

Associated Soils

These are the competing Delwin, Devol, Grandfield, and Nobscot soils. Devol and Nobscot soils are in the same landscape positions as the Heatly soils or in slightly higher positions. Delwin and Grandfield soil are in the lower landscape positions.

Typical Pedon

Heatly fine sand, in an area of idle cropland; Cottle County, Texas; 7.1 miles north of courthouse in Paducah on U.S. Highways 83 and 62, about 0.45 mile west on Farm Road 3256, and 790 feet north in idle cropland; latitude—34 degrees, 7 minutes, 13 seconds N.; longitude—100 degrees, 18 minutes, 20 seconds W.; USGS quadrangle—Paducah; NAD 1929.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 28 inches; light brown (7.5YR 6/4) fine sand, brown (7.5YR 5/4) moist; single grained; loose; slightly acid; abrupt smooth boundary. (20 to 40 inches thick)

AB—28 to 34 inches; reddish brown (5YR 5/4) sandy loam, reddish brown (5YR 4/4) moist; weak coarse subangular blocky structure; hard, friable; neutral; gradual smooth boundary. (0 to 12 inches thick)

Bt1—34 to 52 inches; red (2.5YR 5/6) sandy clay loam, red (2.5YR 4/6) moist; moderate coarse blocky structure; very hard, friable; few distinct clay films on vertical faces of peds; neutral; diffuse smooth boundary. (5 to 21 inches thick)

Bt2—52 to 64 inches; red (2.5YR 5/6) sandy clay loam, red (2.5YR 4/6) moist; weak coarse subangular blocky structure; hard, friable; few distinct clay films on vertical faces of peds; neutral; diffuse smooth boundary. (7 to 20 inches thick)

Bt3—64 to 74 inches; reddish brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; weak coarse subangular blocky structure; hard, friable; few distinct clay films on vertical faces of peds; neutral; gradual smooth boundary. (6 to 24 inches thick)

Bt4—74 to 80 inches; yellowish red (5YR 5/6) sandy clay loam, reddish brown (5YR 5/4) moist; moderate coarse subangular blocky structure; very hard, firm; few distinct clay films on vertical faces of peds; neutral.

Range in Characteristics

Thickness of the solum: More than 80 inches

Depth to an argillic horizon: 20 to 40 inches

Particle-size control section (weighted average):

Clay content—19 to 35 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 5YR to 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 3 to 6

Texture—fine sand or sand

Effervescence—noneffervescent

Reaction—slightly acid or neutral

AB horizon:

Color—hue of 5YR or 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4

Texture—sandy loam, fine sandy loam, or sandy clay loam

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Effervescence—noneffervescent

Reaction—slightly acid or neutral

Bt horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 to 8

Texture—sandy clay loam

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

Hollister Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, clayey alluvial material of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces

Position: Treads

Slope: 0 to 3 percent

Mean annual precipitation: 24 to 30 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 33 to 44

Taxonomic classification: Fine, smectitic, thermic Typic Haplusterts

Associated Soils

These are soils of the Abilene, Roscoe, Rotan, Sagerton, Tillman, Tilvern, Vernon, and Westill series. Abilene, Rotan, Sagerton, Tillman, and Westill soils are in landscape positions similar to those of the Hollister soils or in slightly higher positions. They have an argillic horizon. Roscoe soils are moderately well drained, are dominated by chroma of 1 or less in the surface layer, and are on the slightly lower parts of the landscape. Tilvern and Vernon soils have an ochric epipedon, have Permian age-sediments within a depth of 60 inches, and are higher or lower on the landscape than the Hollister soils.

Typical Pedon

Hollister clay loam (fig. 8), in an area of cropland; Hardeman County, Texas; from the intersection of Farm Road 2006 and U.S. Highway 287 in Chillicothe, 3.4 miles west on U.S. Highway 287, about 2.05 miles south on a county road, and 130 feet east of the county road in cropland; latitude—34 degrees, 13 minutes, 35 seconds N.; longitude—99 degrees, 34 minutes, 26 seconds W; USGS quadrangle—Medicine Mound; NAD 1927.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; hard, friable common fine roots; noneffervescent; slightly alkaline; abrupt smooth boundary. (4 to 10 inches thick)

Bw—6 to 12 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; very



Figure 8.—Slickensides in a Hollister soil. Slickensides are caused by the movement of clayey material that has a high shrink-swell potential.

- hard, firm; common fine roots; few very fine pores; slightly effervescent; moderately alkaline; clear wavy boundary. (0 to 10 inches thick)
- Bss1—12 to 32 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse wedge-shaped aggregates parting to moderate medium angular blocky structure; extremely hard, very firm; few fine roots; few very fine pores; common distinct slickensides; few fine calcium carbonate concretions; strongly effervescent; moderately alkaline; gradual wavy boundary. (8 to 30 inches thick)
- Bss2—32 to 52 inches; grayish brown (10YR 5/2) clay, brown (10YR 4/3) moist; moderate coarse wedge-shaped aggregates parting to moderate medium angular blocky structure; extremely hard, very firm; few fine roots; few very fine pores; many distinct slickensides; few fine calcium carbonate concretions; strongly effervescent; moderately alkaline; gradual wavy boundary. (0 to 28 inches thick)
- Bkss1—52 to 60 inches; grayish brown (10YR 5/2) clay, brown (10YR 4/3) moist; moderate coarse wedge-shaped aggregates parting to moderate medium angular blocky structure; extremely hard, firm; few fine pores; many distinct slickensides; few streaks and pockets of gypsum; 3 to 5 percent masses and concretions of calcium carbonate, increasing with increasing depth; strongly effervescent; moderately alkaline; gradual wavy boundary. (6 to 24 inches thick)
- Bkss2—60 to 70 inches; yellowish red (5YR 5/6) clay, yellowish red (5YR 4/6) moist; moderate coarse wedge-shaped aggregates parting to moderate medium angular blocky structure; hard, friable; few fine pores; many distinct slickensides; few pockets of gypsum; 5 to 10 percent masses of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary. (0 to 22 inches thick)
- 2BCss—70 to 75 inches; red (2.5YR 5/6) clay, red (2.5YR 4/6) moist; laminated with light gray or light olive gray, weathered claystone; weak coarse angular blocky structure; very hard, firm; common distinct slickensides; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to secondary calcium carbonates: 6 to 30 inches

Thickness of the mollic epipedon: 20 to 48 inches; includes the upper Bss horizons in most pedons, except for those in the microhighs

Depth to slickensides: 8 to 20 inches

Vertic features: Microhighs generally are not visible but occur as circular spots 5 to 15 feet in diameter and make up less than 20 percent of the soil area. A microlow 4 to 8 feet in diameter occurs in some areas. The microlows are 4 to 8 inches deeper than the surrounding surface and make up less than 5 percent of the soil area. When the soils are dry, cracks 0.4 inch to 2 or more inches wide extend from the surface to a depth of 30 inches or more. The cracks remain open for 150 or more cumulative days during most years.

Clay content in the particle-size control section (weighted average): 38 to 55 percent

A horizon:

Color—hue of 7.5YR to 10YR, value of 3 to 5 (2 or 3 moist), and chroma of 2 or 3

Texture—clay loam or silty clay loam (fig. 9)

Clay content—30 to 40 percent

Calcium carbonate equivalent—0 to 2 percent

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral to moderately alkaline

Bw horizon:

Color—hue of 7.5YR to 10YR, value of 3 to 5 (2 or 3 moist), and chroma of 2 or 3

Texture—clay loam, silty clay loam, silty clay, or clay

Clay content—35 to 50 percent

Calcium carbonate equivalent—2 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—0 to 2 percent

Effervescence—very slightly effervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Bss horizon:

Color—hue of 5YR to 10YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 to 4

Texture—clay loam, silty clay loam, silty clay, or clay

Clay content—35 to 55 percent

Calcium carbonate equivalent—2 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 4

Gypsum content—0 to 2 percent

Sodium adsorption ratio (SAR)—1 to 8

Effervescence—slightly effervescent or strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Bkss horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6

Texture—clay loam, silty clay loam, silty clay, or clay

Clay content—35 to 55 percent

Calcium carbonate equivalent—3 to 15 percent

Visible secondary carbonates—few or common fine or medium concretions, masses, or films

Electrical conductivity (EC)—dS/m of 0 to 6

Gypsum content—0 to 5 percent

Sodium adsorption ratio (SAR)—1 to 8

Effervescence—slightly effervescent or strongly effervescent

Reaction—slightly alkaline or moderately alkaline

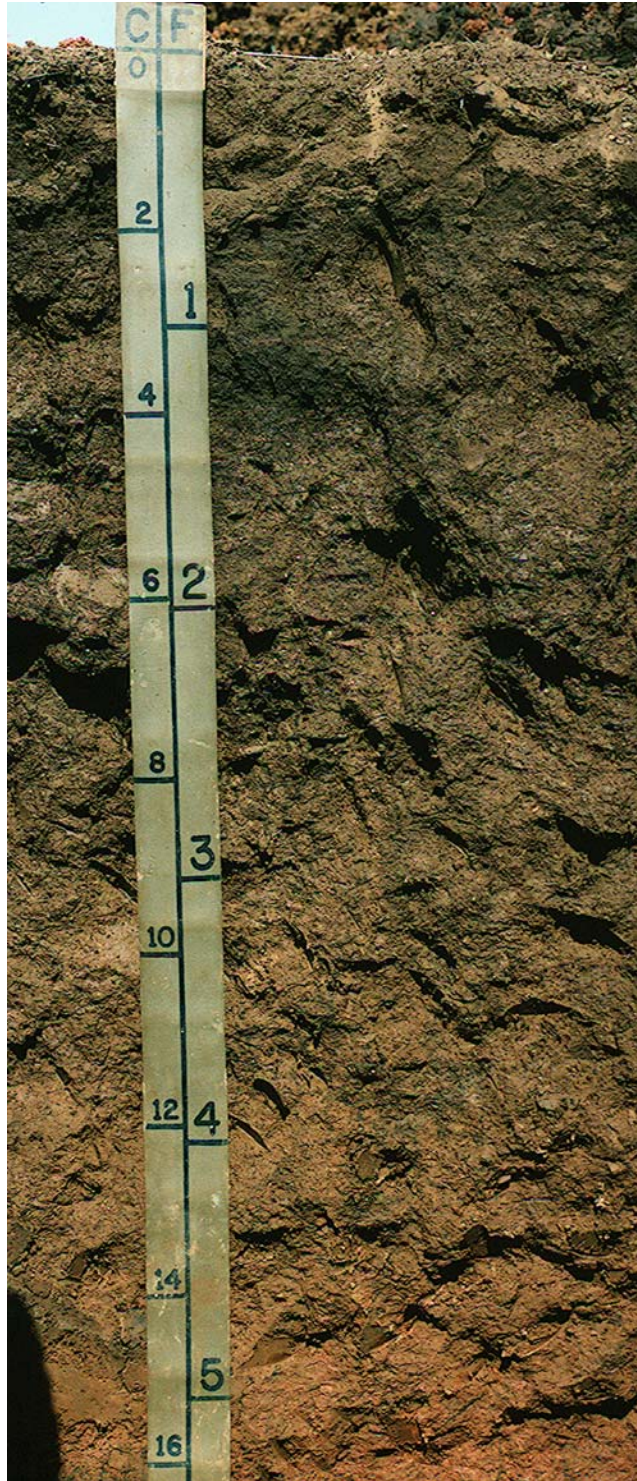


Figure 9.—Profile of Hollister silty clay loam. The left side of the scale is in centimeters times 10, and the right side is in feet.

Bk horizon (where present):

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6

Texture—clay loam, silty clay loam, silty clay, or clay

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Clay content—35 to 50 percent
Calcium carbonate equivalent—3 to 15 percent
Visible secondary carbonates—common or many fine or medium threads, masses, or concretions
Electrical conductivity (EC)—dS/m of 0 to 6
Gypsum content—0 to 5 percent
Sodium adsorption ratio (SAR)—1 to 8
Effervescence—strongly effervescent or violently effervescent
Reaction—moderately alkaline

2BC horizon:(where present)

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6
Texture—clay loam, silty clay loam, silty clay, or clay; material weathered from claystone occurring in some pedons
Clay content—35 to 50 percent
Calcium carbonate equivalent—3 to 15 percent
Visible secondary carbonates—few or common fine or medium concretions, masses, or threads
Electrical conductivity (EC)—dS/m of 0 to 6
Gypsum content—0 to 5 percent
Sodium adsorption ratio (SAR)—1 to 8
Effervescence—slightly effervescent or strongly effervescent
Reaction—slightly alkaline or moderately alkaline

2C horizon:(where present)

Color—hue of 2.5YR or 5YR, value of 3 to 6 (2 to 5 moist), and chroma of 4 to 6; grayish strata occurring in many areas
Texture—clay or claystone
Clay content—35 to 50 percent
Calcium carbonate equivalent—3 to 15 percent
Electrical conductivity (EC)—dS/m of 0 to 6
Gypsum content—0 to 5 percent
Sodium adsorption ratio (SAR)—1 to 8
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

Jester Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Excessively drained

Flooding: Low areas subject to rare flooding

Parent material and geologic age: Sandy eolian sediments of Recent age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: River valleys

Landform: Dunes

Slope: 1 to 45 percent

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 57 to 65 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Mixed, thermic, Typic Ustipsamments

Associated Soils

These are soils of the competing Tivoli series of the same family and soils of the Devol, Ezell, Gracemore, Gracemont, Hardeman, Lincoln, and Westola series. Tivoli soils are on the higher parts of the landscape and are not calcareous in the control section. Devol and Hardeman soils have a coarse-loamy particle-size control section and are in the higher landscape positions. Ezell, Gracemore, Gracemont, Lincoln, and Westola soils are on the surrounding flood plains. Ezell soils are ponded for extended periods. Gracemore and Gracemont soils have a water table near the surface most of the year. Gracemore and Lincoln soils have loamy fine sand or coarser material in the textural control section. Gracemont and Westola soils have a coarse-loamy textural control section.

Typical Pedon

Jester fine sand, in an area of rangeland; Woods County, Oklahoma; about 5 miles south and 1 mile east of Waynoka; 1,150 feet south and 1,800 feet west of the northeast corner of sec. 31, T. 24 N., R. 15 W.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 8 inches; brown (10YR 5/3) fine sand, brown (10YR 4/3) moist; single grained; soft, very friable; many fine and few medium and coarse roots; slightly effervescent; slightly alkaline; clear wavy boundary. (4 to 12 inches thick)
- C1—8 to 27 inches; light brown (7.5YR 6/4) fine sand, brown (7.5YR 5/4) moist; single grained; loose; few fine roots; faint cross-bedding; strongly effervescent; moderately alkaline; gradual wavy boundary. (0 to 18 inches thick)
- C2—27 to 80 inches; pink (7.5YR 7/4) fine sand, light brown (7.5YR 6/4) moist; single grained; loose; few fine roots; faint cross-bedding; strongly effervescent; moderately alkaline.

Range in Characteristics

A horizon:

Color—hue of 10YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 4
Texture—fine sand, loamy sand, loamy fine sand, or sand
Calcium carbonate equivalent—0 to 2 percent
Effervescence—noneffervescent to slightly effervescent
Reaction—slightly to moderately alkaline

AC horizon (where present):

Color—hue of 5YR to 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 or 6
Texture—loamy fine sand, loamy sand, or fine sand
Calcium carbonate equivalent—0 to 2 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—slightly alkaline or moderately alkaline

C horizon:

Color—hue of 5YR to 10YR, value of 5 to 8 (4 to 7 moist), and chroma of 3 to 6
Texture—fine sand, loamy sand, sand, or loamy fine sand
Calcium carbonate equivalent—1 to 5 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Some pedons have stratified alluvial sediments below a depth of 40 inches.

Knoco Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very shallow or shallow

Drainage class: Well drained

Parent material and geologic age: Residuum over dense, noncemented claystone bedrock of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Uplands

Landform: Hills, escarpments, and pediments

Position: Side slopes and base slopes

Slope: 1 to 60 percent

Mean annual precipitation: 22 to 30 inches

Mean annual air temperature: 57 to 66 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Clayey, mixed, active, calcareous, thermic, shallow Aridic Ustorthents

Associated Soils

These are soils of the Aspermont, Beckman, Burson, Cottonwood, Heman, Talpa, Tillman, Tilvern, Vernon, Vinson, and Westill series. Aspermont soils have 18 to 35 percent clay in the control section and are in the higher landscape positions. Beckman soils are very deep and are on the lower flood plains. Burson soils are underlain by sandstone and are in the higher landscape positions. Cottonwood soils are underlain by gypsum and are in landscape positions similar to those of the Knoco soils. Heman soils have strongly contrasting particle-size classes and are on flood plains. Talpa soils are in the higher landscape positions and are underlain by dolomitic limestone. Tillman and Westill soils are on broad plains above the Knoco soils and have a mollic epipedon. Tilvern soils are in the higher landscape positions and are 40 to 60 inches deep to densic material. Vernon soils are in landscape positions similar to those of the Knoco soils. They are 20 to 40 inches deep to densic material. Vinson soils have a mollic epipedon, are underlain by have gypsum bedrock, and are in the higher landscape positions.

Typical Pedon

Knoco clay, in an area of rangeland; Wilbarger County, Texas; from the intersection of U.S. Highway 183-283 and Texas Farm to Market Road 1763 about 12.5 miles south-southeast of Vernon, 2.62 miles south-southeast on U.S. Highway 183-283 (0.96 mile south-southeast of Beaver Creek) and 175 feet east-northeast in rangeland; latitude—35 degrees, 57 minutes, 00 seconds N.; longitude—99 degrees, 12 minutes, 21 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- A1—0 to 5 inches; red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; moderate fine subangular blocky structure; very hard, firm, slightly sticky, plastic; many fine and common medium roots; few medium and coarse concretions of calcium carbonate; many caliche and few sandstone pebbles on the surface; slightly effervescent; moderately alkaline; clear smooth boundary. (3 to 14 inches thick)
- A2—5 to 9 inches; reddish brown (2.5YR 5/4) clay, reddish brown (2.5YR 4/4) moist; weak fine and medium subangular blocky structure; very hard, firm, slightly sticky,

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- plastic; many fine and common medium roots; few medium and coarse concretions of calcium carbonate; slightly effervescent; moderately alkaline; gradual smooth boundary. (0 to 11 inches thick)
- Cd1—9 to 19 inches; reddish brown (2.5YR 5/4), dense clay and noncemented claystone fragments, reddish brown (2.5YR 4/4) moist; massive with moderate medium angular rock structure; extremely hard, very firm, sticky, plastic; common fine and medium roots; few masses of light greenish gray (5GY 7/1) and gray (5Y 6/1) claystone; very slightly effervescent; moderately alkaline; clear smooth boundary. (1 to 16 inches thick)
- Cd2—19 to 28 inches; reddish brown (2.5YR 4/4), noncemented claystone bedrock, reddish brown (2.5YR 4/4) moist; massive with moderate coarse angular rock structure parting to fine angular blocks; extremely hard, extremely firm, very sticky, plastic; very few medium roots, about 10 to 14 inches apart, along fracture planes; few reduction masses of light greenish gray (5GY 7/1) and gray (5Y 6/1) claystone; very slightly effervescent; moderately alkaline; clear smooth boundary. (0 to 12 inches thick)
- Cd3—28 to 60 inches; reddish brown (2.5YR 4/4), noncemented claystone bedrock, reddish brown (2.5YR 4/4) moist; massive with moderate very coarse angular rock structure; extremely hard, extremely firm, very sticky, plastic; common masses and thin strata of light greenish gray (5GY 7/1) and gray (5Y 6/1) claystone; very slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 3 to 20 inches

Depth to densic material and noncemented claystone bedrock: 3 to 20 inches

Particle-size control section (weighted average):

Clay content—40 to 60 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 10R to 5YR, value of 3 to 5 (2 to 4 moist), and chroma of 3 to 6

Texture—clay loam, silty clay, or clay

Clay content—35 to 60 percent

Calcium carbonate equivalent—1 to 8 percent

Electrical conductivity (EC)—dS/m of 1 to 4

Gypsum content—0 to 15 percent

Sodium adsorption ratio (SAR)—0 to 8

Effervescence—very slightly effervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Cd1 horizon:

Color—hue of 10R to 5YR, value of 3 to 6 (2 to 5 moist), and chroma of 3 to 6

Texture—clay or silty clay; slakes rapidly in water and is densic in more than 50 percent of the layer

Clay content—40 to 60 percent

Moist bulk density (g/cc)—1.55 to 1.9; high enough that roots penetrate the material only in cracks and along cleavage planes

Excavation difficulty—low or moderate

Content of rock fragments, by volume—1 to 10 percent fragments of claystone that crush or slake to clay

Calcium carbonate equivalent—1 to 8 percent

Visible secondary carbonates—in some pedons, masses or films along cleavage planes or fractures

Electrical conductivity (EC)—dS/m of 1 to 8

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Gypsum content—0 to 15 percent

Sodium adsorption ratio (SAR)—0 to 8

Effervescence—very slightly effervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Cd2 and Cd3 horizons:

Color—hue of either 10R to 5YR or 5GY, value of 3 to 7 (2 to 6 moist), and chroma of 1 to 6

Texture—noncemented claystone of clay or silty clay texture; slakes rapidly in water, is densic and may or may not qualify as a densic contact, and in some pedons has thin, discontinuous strata of limestone or sandstone

Moist bulk density (g/cc)—1.7 to 2.25

Excavation difficulty—moderate or high

Calcium carbonate equivalent—1 to 8 percent

Electrical conductivity (EC)—dS/m of 1 to 8

Gypsum content—0 to 15 percent

Sodium adsorption ratio (SAR)—0 to 8

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

La Casa Series

Major land resource area: Central Rolling Red Plains, Western Part (78B)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Local alluvial or colluvial sediments deposited over red-bed claystone and siltstone of the Blaine Formation of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Karstland

Landform: Hills

Position: Base slopes

Slope: 0 to 3 percent

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Thornthwaite PE index: 33 to 40

Taxonomic classification: Fine, mixed, superactive, thermic Typic Argiustolls

Associated Soils

These are soils of the Aspermont, Cottonwood, Harmon, Nipsum, and Talpa series. Aspermont soils have a fine-silty particle-size control section, have an ochric epipedon, and are in the higher convex areas. Cottonwood, Harmon, and Talpa soils are very shallow or shallow to bedrock and are in the higher landscape positions. Nipsum soils are in the lower depressional areas and have a mollic epipedon that is more than 20 inches thick.

Typical Pedon

La Casa silty clay loam, on a slope of 2 percent in an area of cropland; Jackson County, Oklahoma; from the intersection of U.S. Highway 62 and Oklahoma State Highway 34 at Duke, 2.5 miles south and 3 miles west on a county road to intersection; 400 feet north and 500 feet east in cropland; 400 feet north and 500 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.; USGS quadrangle—Prairie

Soil Survey of Jackson County, Oklahoma

Hill; latitude—34 degrees, 37 minutes, 27 seconds N.; longitude—99 degrees, 36 minutes, 47 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- Ap—0 to 6 inches; reddish brown (5YR 4/4) silty clay loam, dark reddish brown (5YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, very friable; common very fine and fine roots; common very fine interstitial and tubular pores; slightly effervescent; slightly alkaline; abrupt smooth boundary. (6 to 10 inches thick)
- Bt—6 to 12 inches; dark reddish brown (5YR 3/4) silty clay loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; hard, friable; common very fine and fine roots; common very fine interstitial and tubular pores; few distinct clay films on faces of peds; few fine concretions of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary. (0 to 22 inches thick)
- Btk1—12 to 34 inches; reddish brown (5YR 5/4) silty clay, reddish brown (5YR 4/4) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, firm; few very fine roots; common very fine interstitial and tubular pores; many distinct clay films on faces of peds; few pressure faces; common fine concretions of calcium carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.
- Btk2—34 to 47 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, firm; few very fine roots; common very fine interstitial and tubular pores; common distinct clay films on faces of peds; common fine masses and common medium concretions of calcium carbonate; few fine iron-manganese masses; 1 percent claystone paragravel; violently effervescent; moderately alkaline; gradual wavy boundary.
- Btk3—47 to 64 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, firm; few very fine roots; common very fine interstitial and tubular pores; common distinct clay films on faces of peds; common masses and common concretions of calcium carbonate; common iron-manganese masses; 2 percent angular claystone paragravel and 1 percent angular dolomite gravel; strongly effervescent; moderately alkaline; gradual wavy boundary. (Combined thickness of the Btk horizons ranging from 20 to 54 inches)
- Bck—64 to 81 inches; reddish brown (2.5YR 5/4) silty clay loam, reddish brown (2.5YR 4/4) moist; common fine and medium distinct brown (7.5YR 4/3) mottles; moderate medium prismatic structure parting to weak fine and medium angular blocky; extremely hard, firm; common very fine interstitial and tubular pores; common fine and medium masses of calcium carbonate; common medium wormcasts; 10 percent angular claystone paragravel; strongly effervescent; moderately alkaline; gradual wavy boundary. (0 to 25 inches thick)
- C—81 to 90 inches; 50 percent reddish brown (2.5YR 5/4) and 50 percent light olive gray (5Y 6/2) claystone and siltstone with texture of silty clay loam, 50 percent reddish brown (2.5YR 4/4) and 50 percent olive gray (5Y 5/2) moist; massive; extremely hard, very firm; few very fine interstitial and tubular pores; 15 percent angular dolomite gravel; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to secondary calcium carbonates: 0 to 22 inches

Depth to a calcic horizon: More than 30 inches (fig. 10)

Thickness of the mollic epipedon: 7 to 20 inches

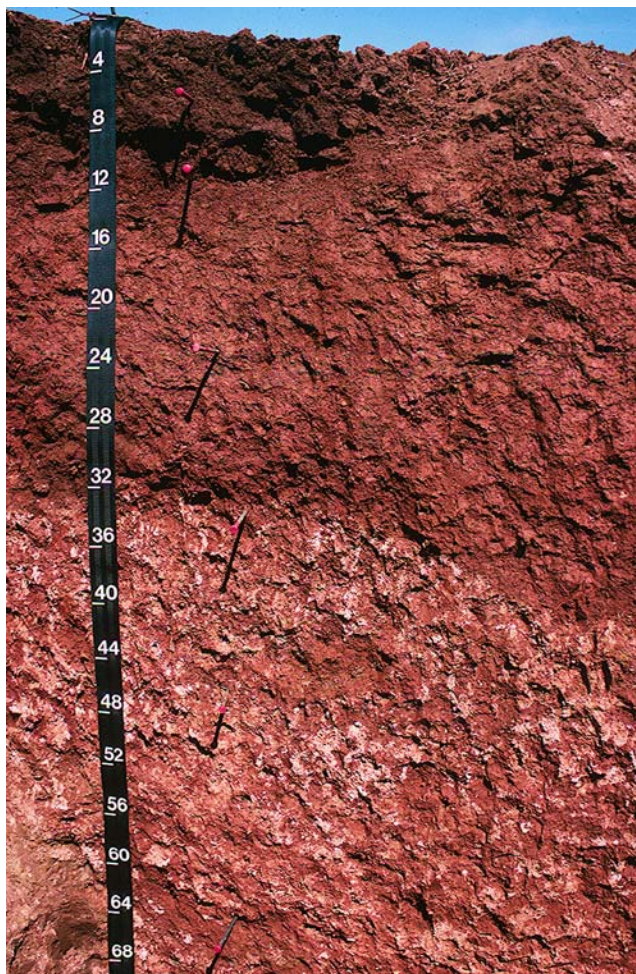


Figure 10.—Profile of La Casa silty clay loam. A calcic horizon is below a depth of about 34 inches.

Particle-size control section (weighted average):

Clay content—35 to 45 percent

CEC/clay ratio—0.6 or more

A horizon:

Color—hue of 5YR or 7.5YR, value of 4 or 5 (3 moist), and chroma of 2 or 3

Texture—silty clay loam or clay loam

Calcium carbonate equivalent—0 to 2 percent

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly alkaline or moderately alkaline

Bt horizon (where present):

Color—hue of 5YR or 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4

Texture—silty clay loam, clay loam, silty clay, or clay

Calcium carbonate equivalent—0 to 5 percent

Effervescence—slightly effervescent or strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Btk horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 to

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Texture—silty clay loam, clay loam, silty clay, or clay
Calcium carbonate equivalent—10 to 40 percent
Visible secondary carbonates—2 to 20 percent, by volume, concretions, films, threads, or masses
Effervescence—strongly effervescent or violently effervescent
Reaction—moderately alkaline

B_{ck} horizon:

Color—hue of 2.5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 7
Texture—silty clay loam, clay loam, silty clay, or clay
Rock fragments—in most pedons, few or common paragravel fragments of claystone or siltstone and gravel- or cobble-size fragments of dolomite
Calcium carbonate equivalent—5 to 20 percent
Visible secondary carbonates—1 to 10 percent, by volume, concretions, films, threads, or masses
Electrical conductivity (EC)—dS/m of 0 to 4
Gypsum content—0 to 4 percent
Effervescence—strongly effervescent or violently effervescent
Reaction—moderately alkaline

C horizon:

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 or 6
Texture—silty clay loam, clay loam, silty clay, or clay
Content of rock fragments, by volume—1 to 10 percent paragravel of claystone or siltstone and gravel- or cobble-size fragments of dolomitic limestone
Calcium carbonate equivalent—2 to 10 percent
Visible secondary carbonates—0 to 2 percent, by volume, concretions, films, threads, or masses
Electrical conductivity (EC)—dS/m of 2 to 8
Gypsum content—0 to 8 percent
Sodium adsorption ratio (SAR)—0 to 6
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

Cr horizon (where present):

Color—hue of 2.5YR, 5YR, 5Y, or 5GY; value of 6 to 8 (5 to 7 moist); and chroma of 1 to 6
Kind of rock—interbedded layers of weakly consolidated claystone and siltstone with thin layers of dolomitic limestone or gypsum in some pedons
Moist bulk density (g/cc)—1.85 to 2.00
Excavation difficulty—moderate or high
Electrical conductivity (EC)—dS/m of 2 to 8
Gypsum content—0 to 8 percent
Sodium adsorption ratio (SAR)—0 to 6
Effervescence—very slightly effervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Lincoln Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C); Southern High Plains, Breaks (77E)

Depth class: Very deep

Drainage class: Somewhat excessively drained

Flooding: Frequently flooded or occasionally flooded for very brief periods during the months of April through October

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Parent material and geologic age: Sandy sediments of Recent age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: River valleys

Landform: Flood plains

Slope: 0 to 3 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Sandy, mixed, thermic Typic Ustifluvents

Associated Soils

These are soils of the Gracemont, Gracemore, Heman, Jester, Tivoli, and Westola series. Gracemont, Gracemore, and Heman soils have a water table at or near the surface and are in landscape positions similar to those of the Lincoln soils. Jester and Tivoli soils do not have fluventic features and are in hummocky areas or on dunes. Westola soils have a coarse-loamy control section and generally are farther from stream channels and at slightly higher elevations than the Lincoln soils.

Typical Pedon

Lincoln loamy fine sand, in an area of rangeland; Tillman County, Oklahoma; about 2 miles west and 2 miles north of Tipton; 200 feet north and 2,300 feet west of the southeast corner of sec. 28, T. 1 N., R. 19 W; latitude—34 degrees, 31 minutes, 20 seconds N.; longitude—99 degrees, 12 minutes, 2 seconds W; USGS quadrangle—Tipton, Oklahoma; NAD 27.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 11 inches; brown (7.5YR 5/3) loamy fine sand, brown (7.5YR 4/2) moist; weak fine and medium granular structure; soft, very friable; thin strata and masses of fine sand to loam; slightly effervescent; moderately alkaline; clear smooth boundary. (3 to 15 inches thick)
- C—11 to 80 inches; pink (7.5YR 7/4) fine sand, light brown (7.5YR 6/4) moist; single grained; loose, very friable; very thin to 1-inch-thick strata of darker fine sandy loam to clay loam that decrease in thickness and number with increasing depth; bedding planes are evident; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to endosaturation: 5 to 8 feet during the months of November to May

Clay content in the particle-size control section (weighted average): 0 to 15 percent

A horizon:

Color—hue of 5YR to 2.5Y, value of 4 to 7 dry (3 to 5 moist), and chroma of 2 to 6; horizon thickness of less than 10 inches where moist value and chroma are 3 or less

Texture—loamy fine sand, loamy sand, sand, fine sandy loam, loam, or clay loam; sand to clay loam in the upper 10 inches and loamy fine sand to sand below a depth of 10 inches

Content of rock fragments, by volume—0 to 10 percent rock fragments from 2 to 76 millimeters in diameter

Calcium carbonate equivalent—0 to 5 percent

Effervescence—slightly effervescent or strongly effervescent

Reaction—slightly alkaline or moderately alkaline

C horizon:

Color—hue of 5YR to 2.5Y, value of 5 to 8 dry (3 to 5 moist), and chroma of 2 to 6
Texture—sand to loamy fine sand with strata of fine sandy loam, sandy clay loam, or clay loam that are less than 1 inch thick and are darker and contain more organic carbon than the rest of the horizon
Calcium carbonate equivalent—0 to 5 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

Madge Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces

Position: Treads

Slope: 0 to 3 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, superactive, thermic Typic Argiustolls

Associated Soils

These are soils of the Dodson, Shrewder, St. Paul, and Woodward series. Dodson soils have a fine textured particle-size control section and are in landscape positions similar to those of the Madge soils. Shrewder soils have a coarse-loamy particle-size control section, do not have an argillic horizon, and generally occur on side slopes or in convex areas. St. Paul soils have a fine-silty particle-size control section, have a mollic epipedon that is more than 20 inches thick, and occur on broad upland plains. Woodward soils have an ochric epipedon, are moderately deep over sandstone bedrock, and occur in the higher areas.

Typical Pedon

Madge loam, in an area of wheat; Harmon County, Oklahoma; about 1 mile west and 1 mile south of Vinson; 200 feet north and 2,400 feet east of the southwest corner of sec. 19, T. 5 N., R. 25 W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 9 inches; reddish brown (5YR 4/3) loam, dark reddish brown (5YR 3/3) moist; moderate fine granular structure; slightly hard, friable; few fine roots; slightly acid; abrupt smooth boundary. (5 to 12 inches thick)

A—9 to 13 inches; dark reddish gray (5YR 4/2) loam, dark reddish brown (5YR 3/2) moist; moderate fine subangular blocky structure parting to moderate fine granular; slightly hard, friable; few fine roots; common fine pores; few wormcasts; slightly alkaline; gradual smooth boundary. (0 to 10 inches thick)

BA—13 to 18 inches; reddish brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure parting to moderate

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- medium granular; slightly hard, friable; few fine roots; common fine pores; few wormcasts; neutral; gradual smooth boundary. (0 to 6 inches thick)
- Bt1—18 to 25 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate fine and medium prismatic structure parting to moderate medium subangular blocky; hard, firm; few fine roots; common fine pores; common wormcasts; thin continuous clay films on faces of peds; neutral; gradual smooth boundary. (6 to 17 inches thick)
- Bt2—25 to 41 inches; reddish brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; moderate medium prismatic structure parting to weak medium subangular blocky; hard, firm; few fine roots; common fine pores; common wormcasts; thin continuous clay films on faces of peds; neutral; gradual smooth boundary. (9 to 24 inches thick)
- BC—41 to 57 inches; red (2.5YR 5/6) loam, red (2.5YR 4/6) moist; moderate coarse prismatic structure; hard, friable; few fine roots; patchy clay films on vertical faces of prisms; few pockets of clean sand grains; neutral; gradual smooth boundary. (8 to 20 inches thick)
- C—57 to 80 inches; red (2.5YR 5/8) fine sandy loam, red (2.5YR 4/8) moist; massive; slightly hard, friable; moderately alkaline.

Range in Characteristics

Thickness of the solum: 50 to more than 80 inches

Depth to secondary calcium carbonates: More than 36 inches

Thickness of the mollic epipedon: 10 to 20 inches

Particle-size control section (weighted average):

Clay content—18 to 35 percent

Content of rock fragments—0 to 3 percent

CEC/clay ratio—more than 0.6

Ap and A horizons:

Color—hue of 5YR or 7.5YR, value of 3 or 4 (2 or 3 moist), and chroma of 2 or 3

Texture—loam or fine sandy loam

Clay content—8 to 25 percent

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

BA or AB horizon:

Color—hue of 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3

Texture—loam, clay loam, or sandy clay loam

Clay content—18 to 35 percent

Content of rock fragments, by volume—0 to 3 percent rounded gravel less than 3 inches in diameter

Effervescence—noneffervescent

Reaction—neutral to moderately alkaline

Upper part of the Bt horizon:

Color—hue of 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 to 6

Texture—clay loam, sandy clay loam, or loam

Clay content—18 to 35 percent

Content of rock fragments, by volume—0 to 3 percent rounded gravel less than 3 inches in diameter

Effervescence—noneffervescent

Reaction—neutral to moderately alkaline

Lower part of the Bt horizon:

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6

Texture—clay loam, sandy clay loam, loam, or fine sandy loam

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Clay content—18 to 35 percent

Content of rock fragments, by volume—0 to 3 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 10 percent

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

BC or BCk horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 to 8

Texture—loam, very fine sandy loam, fine sandy loam, or loamy sand

Content of rock fragments, by volume—0 to 3 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—0 to 10 percent

Visible secondary carbonates—0 to 5 percent concretions, masses, or threads

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

C horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 6 to 8

Texture—loam, very fine sandy loam, fine sandy loam, loamy sand, or sand

Content of rock fragments, by volume—0 to 5 percent rounded gravel less than 3 inches in diameter; fragments of soft sandstone or shale, less than 3 inches in diameter, below a depth of 72 inches in some pedons

Calcium carbonate equivalent—0 to 10 percent

Visible secondary carbonates—0 to 5 percent concretions, masses, or threads

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Mangum Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Flooding: Frequently flooded to rarely flooded for very brief periods, mainly during the spring and summer months

Parent material and geologic age: Calcareous, clayey alluvial material derived from shale of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains and uplands

Landform: Flood plains

Slope: 0 to 1 percent

Mean annual precipitation: 19 to 32 inches

Mean annual air temperature: 57 to 68 degrees F

Thornthwaite PE index: 28 to 44

Taxonomic classification: Fine, mixed, active, thermic Vertic Haplustepts

Associated Soils

These are soils of the Beckman, Clairemont, Colorado, Gageby, Spur, Treadway and Weswood series. Beckman soils have a water table within a depth of 6 feet and have electrical conductivity of more than 4 dS/m within a depth of 20 inches.

Clairemont, Colorado, Gageby, Spur, and Weswood soils have less than 35 percent

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clay in the control section and formed in alluvial sediments that are less clayey than the parent material of the Mangum soils. Treadway soils have electrical conductivity of more than 2 mmhos within a depth of 40 inches and occur in the higher landscape positions.

Typical Pedon

Mangum clay, in an area of pasture; Scurry County, Texas; 15½ air miles southwest of Snyder; on the flood plain along the Colorado River; 25 feet west of a county road from a point 0.33 mile north of the Colorado River Bridge below the dam of Lake J.B. Thomas.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 7 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate fine and medium blocky structure; very hard, firm, sticky; few grass roots; few very fine pores; calcareous; moderately alkaline; clear smooth boundary. (5 to 16 inches thick)
- Bw—7 to 24 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate fine and medium angular blocky structure; extremely hard, very firm, sticky; few fine roots; few very fine pores; cracks 1 to 1½ centimeters wide extending from the top to the bottom of the horizon; calcareous; moderately alkaline; abrupt smooth boundary. (8 to 36 inches thick)
- C1—24 to 48 inches; red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; massive; extremely hard, very firm, sticky; few fine pores; bedding planes are evident; few dark vertical streaks along cracks; few fine calcium carbonate concretions in the lower part; calcareous; moderately alkaline; gradual smooth boundary. (0 to 30 inches thick)
- C2—48 to 80 inches; red (2.5YR 5/6) silty clay, red (2.5YR 4/6) moist; massive; very hard, very firm, sticky; few fine calcium carbonate concretions and films and threads of secondary calcium carbonate; bedding planes in the lower part; calcareous; moderately alkaline.

Range in Characteristics

Vertic features: Cracks 1 to 1.5 centimeters wide extending from the surface to a depth of 24 inches or more

Particle-size control section (weighted average):

Clay content—35 to 60 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 4; moist value or chroma of 3.5 or more where the horizon is 10 or more inches thick

Texture—clay, silty clay, silty clay loam, or silt loam

Clay content—20 to 60 percent

Calcium carbonate equivalent—0 to 5 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent to strongly effervescent

Reaction—moderately alkaline

Bw horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—clay, silty clay, silty clay loam, or clay loam

Clay content—35 to 60 percent

Calcium carbonate equivalent—5 to 15 percent

Visible secondary carbonates—few or common films, threads, and concretions

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Electrical conductivity (EC)—dS/m of 0 to 4
Gypsum content—0 to 2 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

C horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6
Texture—clay, silty clay, silty clay loam, or clay loam
Clay content—30 to 55 percent
Calcium carbonate equivalent—5 to 15 percent
Visible secondary carbonates—few or common films, threads, and concretions
Electrical conductivity (EC)—dS/m of 0 to 8
Gypsum content—0 to 5 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

Nipsum Series

Major land resource area: Central Rolling Red Plains, Western Part (78B)

Depth class: Very deep

Drainage class: Well drained

Parent material: Clayey alluvium or colluvium

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Karstland

Landform: Hills

Position: Footslopes and depressions

Slope: 0 to 3 percent

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Thornthwaite PE index: 32 to 38

Taxonomic classification: Fine, mixed, superactive, thermic Cumulic Haplustolls

Associated Soils

These are soils of the Aspermont, Cottonwood, Knoco, Quanah, Talpa, Tilvern, Vernon, and Westill series. Aspermont, Knoco, Tilvern, and Vernon soils have an ochric epipedon and have a solum that is less than 60 inches thick. Cottonwood soils are less than 20 inches deep over gypsum bedrock. Quanah soils have a mollic epipedon that is less than 20 inches thick. Talpa soils are less than 20 inches deep over limestone bedrock. Westill soils have a mollic epipedon that is that is less than 20 inches thick and have an argillic horizon. All of the associated soils are higher on the landscape than the Nipsum soils.

Typical Pedon

Nipsum clay, in an area of rangeland; Stonewall County, Texas; from county courthouse in Aspermont, Texas, 3.6 miles south on U.S. Highway 83, about 4.5 miles east on a county road, 1.2 miles north and west on a private ranch road, and 200 feet north of a private ranch road in rangeland.

(Colors are for dry soil unless otherwise indicated.)

A1—0 to 10 inches; brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; moderate fine subangular blocky and weak fine granular structure; hard, friable; few fine

and medium roots; slightly effervescent; moderately alkaline; clear smooth boundary. (7 to 15 inches thick)

A2—10 to 30 inches; brown (7.5YR 5/2) clay, dark brown (7.5YR 3/2) moist; moderate medium and fine subangular blocky structure; hard, firm; common roots; many very fine pores; common wormcasts; few films and threads of calcium carbonate; slightly effervescent; moderately alkaline; gradual smooth boundary. (10 to 24 inches thick)

Bk1—30 to 48 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate fine subangular blocky structure; hard, firm; about 3 percent, by volume, calcium carbonate concretions; strongly effervescent; moderately alkaline; gradual smooth boundary. (8 to 30 inches thick)

Bk2—48 to 60 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm; common fine concretions of calcium carbonate and gypsum; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to 80 inches

Thickness of the mollic epipedon: 20 to 40 inches (fig. 11)

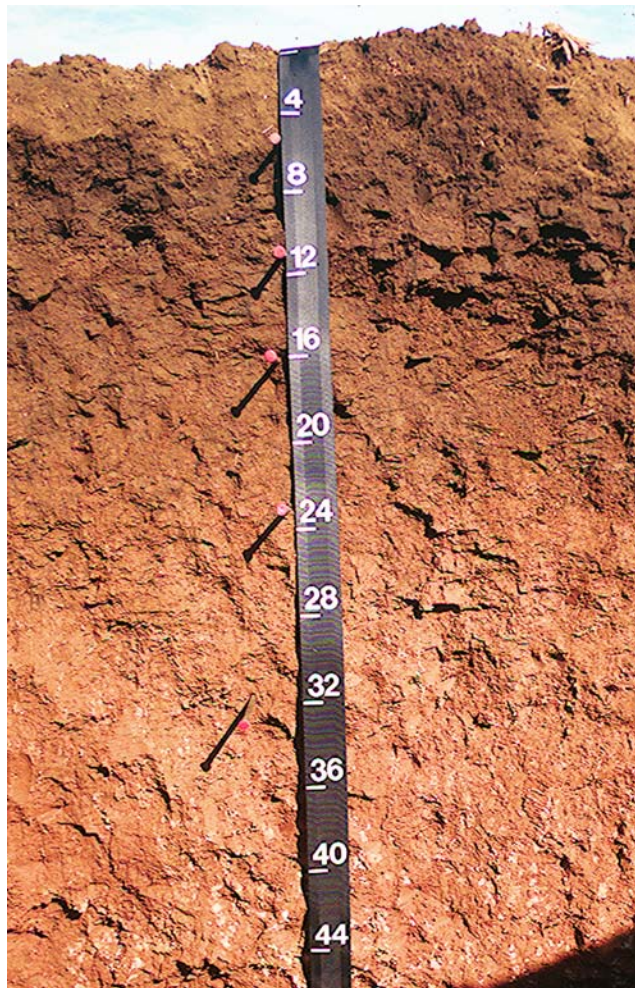


Figure 11.—Profile of Nipsum silty clay loam. The dark mollic epipedon is about 24 inches thick.

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Particle-size control section (weighted average):

Clay content—35 to 55 percent

CEC/clay ratio—0.6 or more

A horizon:

Color—hue of 5YR to 10YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 or 3

Texture—clay, silty clay, silty clay loam, or clay loam

Clay content—35 to 45 percent

Calcium carbonate equivalent—0 to 1 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly alkaline or moderately alkaline

Bk1 horizon:

Color—hue of 5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6

Texture—clay, silty clay, silty clay loam, or clay loam

Clay content—35 to 55 percent

Calcium carbonate equivalent—5 to 20 percent

Visible secondary carbonates—1 to 15 percent, by volume, soft masses, films, threads, and concretions

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—0 to 5 percent

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline

Bk2 horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—clay, silty clay, silty clay loam, or clay loam

Calcium carbonate equivalent—5 to 20 percent

Visible secondary carbonates—1 to 10 percent of masses, films, threads, and concretions

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—1 to 5 percent

Effervescence—slightly effervescent to violently effervescent

Reaction—moderately alkaline

Oakley Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, loamy alluvium over red-bed sediments of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces

Position: Treads

Slope: 0 to 8 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, active, thermic Typic Calciustolls

Associated Soils

These are soils of the Burford, Grandfield, Grandmore, Ozark, Roark, and Tipton series. These soils do not have a calcic horizon. Burford soils have an ochric epipedon, have a Cr horizon of Permian-age red-bed sediments within a depth of 60 inches, and are in landscape positions similar to those of the Oakley soils. Grandfield and Grandmore soils have an ochric epipedon and an argillic horizon and occur in the higher landscape positions. Ozark soils have an argillic horizon and occur in the slightly higher landscape positions. Roark and Tipton soils have an argillic horizon, have a mollic epipedon that is more than 20 inches thick, and occur in broad, nearly level areas on the slightly higher parts of the landscape. Also, Roark soils have a fine textured particle-size control section.

Typical Pedon

Oakley loam (fig. 12), on a slope of 1 percent in an area of cropland; Jackson County, Oklahoma; from the intersection of U.S. Highways 62 and 283 in Altus, about 8 miles east on U.S. Highway 62, about 4 miles north on a paved county road, 0.2 mile west on a county road, and 450 feet north in cropland; 1,100 feet west and 450 feet north of southeast corner of sec. 28, T. 3 N., R. 19 W.; USGS quadrangle—Headrick, Oklahoma; latitude—34 degrees, 41 minutes, 51 seconds N.; longitude—99 degrees, 11 minutes, 51 seconds W.

(Colors are for dry soil unless otherwise indicated.)

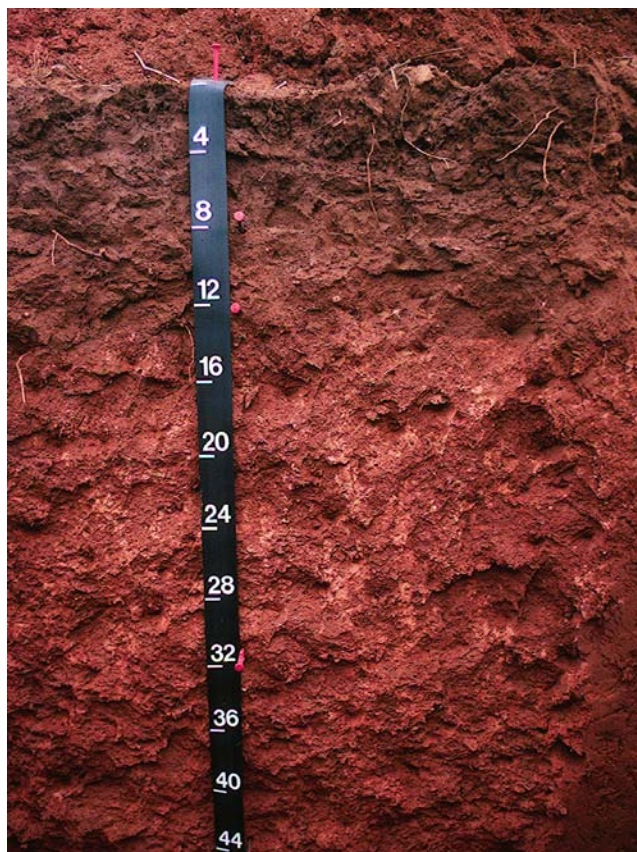


Figure 12.—Profile of Oakley loam. The mollic epipedon extends to a depth of about 8 inches. A calcic horizon is below a depth of about 12 inches.

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- Ap—0 to 7 inches; brown (7.5YR 5/3) loam, dark brown (7.5YR 3/3) moist; moderate fine and medium granular structure; hard, friable; many very fine, fine, and medium roots; few very fine, fine, and medium interstitial and tubular pores; common wormcasts; few fine concretions of calcium carbonate; strongly effervescent; slightly alkaline; abrupt smooth boundary.
- A—7 to 12 inches; reddish brown (5YR 5/3) loam, reddish brown (5YR 4/3) moist; moderate fine and medium granular structure; hard, friable; common very fine, fine, and medium roots; few very fine, fine, and medium interstitial and tubular pores; common wormcasts; few fine masses and common fine and medium concretions of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary. (Combined thickness of the Ap and A horizons ranging from 7 to 16 inches)
- Bk1—12 to 30 inches; red (2.5YR 5/6) loam, red (2.5YR 4/6) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; common very fine, fine, and medium roots; common very fine, fine, and medium interstitial and tubular pores; few fine iron-manganese masses; common medium and coarse masses and common fine and medium concretions of calcium carbonate; violently effervescent; moderately alkaline; gradual wavy boundary.
- Bk2—30 to 43 inches; red (2.5YR 5/6) loam, red (2.5YR 4/6) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; few very fine, fine, and medium roots; common very fine, fine, and medium interstitial and tubular pores; few fine iron-manganese masses; common medium and coarse masses and common fine and medium concretions of calcium carbonate; violently effervescent; strongly alkaline; gradual wavy boundary.
- Bk3—43 to 58 inches; red (2.5YR 5/6) loam, red (2.5YR 4/6) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; very few very fine and fine roots; common very fine, fine, and medium interstitial and tubular pores; common fine and medium masses and common medium and coarse concretions of calcium carbonate; few fine and medium distinct light brown (7.5YR 6/4) iron depletions; strongly effervescent; strongly alkaline; clear smooth boundary. (Combined thickness of the Bk horizons ranging from 21 to 60 inches)
- BC—58 to 85 inches; red (2.5YR 5/8) sandy clay loam, red (2.5YR 4/8) moist; weak coarse prismatic structure; hard, friable; few fine and medium distinct light brown (7.5YR 6/4) iron depletions; slightly effervescent; moderately alkaline; clear smooth boundary. (0 to 30 inches thick)
- C—85 to 95 inches; red (2.5YR 5/8) gravelly sandy loam, red (2.5YR 4/8) moist; weak medium prismatic structure; hard, friable; 20 percent rounded quartzite gravel; few fine and medium distinct light brown (7.5YR 6/4) iron depletions; slightly alkaline; abrupt wavy boundary. (0 to more than 40 inches thick)
- 2Cd—95 to 100 inches; red (2.5YR 5/6), weathered siltstone with texture of silty clay loam, red (2.5YR 4/6) moist; massive; extremely hard, firm; slightly alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to lithologic discontinuity: 60 to more than 80 inches

Depth to secondary calcium carbonates: 0 to 16 inches

Depth to a calcic horizon: 7 to 21 inches

Depth to a perched water table: 4 to 8 feet during the months of October to May in years with above normal rainfall

Depth to redoximorphic depletions: In some pedons a few brown or gray redoximorphic depletions below a depth of 40 inches

Thickness of the mollic epipedon: 7 to 16 inches

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Particle-size control section (weighted average):

Clay content—20 to 35 percent

CEC/clay ratio—0.4 to 0.6

Ap and A horizons:

Color—hue of 5YR to 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3

Texture—loam or clay loam

Calcium carbonate equivalent—2 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Effervescence—slightly effervescent or strongly effervescent

Reaction—neutral to moderately alkaline

Bk horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 or 6

Texture—loam, sandy clay loam, or clay loam

Calcium carbonate equivalent—10 to 35 percent; 15 percent or more in a layer at least 6 inches thick

Visible secondary carbonates—3 to 25 percent, by volume, concretions, films, or masses

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 2 percent

Sodium adsorption ratio (SAR)—0 to 8

Effervescence—strongly effervescent or violently effervescent

Reaction—moderately alkaline or strongly alkaline

BC horizon:

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 8

Texture—loam, sandy loam, sandy clay loam, or clay loam

Calcium carbonate equivalent—3 to 20 percent

Visible secondary carbonates—0 to 5 percent, by volume, concretions, films, or masses

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 2 percent

Sodium adsorption ratio (SAR)—0 to 8

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline or strongly alkaline

C horizon:

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 8

Texture—variable and commonly stratified with textures ranging from loamy sand to clay loam

Content of rock fragments, by volume—0 to 30 percent rounded gravel less than 3 inches in diameter

Calcium carbonate equivalent—3 to 15 percent

Visible secondary carbonates—0 to 5 percent, by volume, concretions, films, or masses

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 2 percent

Sodium adsorption ratio (SAR)—0 to 8

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline or strongly alkaline

2C or 2Cd horizon:

Color—hue of 2.5YR, value of 4 or 5 (3 to 4 moist), and chroma of 4 to 6

Texture—silty clay, silty clay loam, or clay weathered from Permian-age red-bed sediments

Ozark Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Moderately well drained

Parent material and geologic age: Loamy alluvial sediments of Pleistocene age over material weathered from silty or clayey red beds of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Sand sheets

Position: Treads and interdune areas

Slope: 0 to 3 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, active, thermic Typic Argiustolls

Associated Soils

These are soils of the Devol, Eda, Grandfield, Grandmore, and Roark series. Devol, Eda, and Grandfield soils are in the slightly higher landscape positions, have less clay in the particle-size control section than the Ozark soils, and have an ochric epipedon. Grandmore and Roark soils are in landscape positions similar to those of the Ozark soils. Grandmore soils have an ochric epipedon. Roark soils have a fine textured particle-size control section and have a mollic epipedon that is that is more than 20 inches thick.

Typical Pedon

Ozark fine sandy loam (fig. 13), on a slope of 0.3 percent in an improved pasture; Jackson County, Oklahoma; from the intersection of U.S. Highways 62 and 283 in Altus, 6.0 miles east on U.S. Highway 62, about 4.0 miles north and 0.6 mile east on a county road, and 500 feet north in pasture; 500 feet north and 2,000 feet west of the southeast corner of sec. 29, T. 3 N., R. 19 W.; USGS quadrangle—Headrick; latitude—34 degrees, 41 minutes, 49 seconds N.; longitude—99 degrees, 13 minutes, 3 seconds W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 11 inches; brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, very friable; many very fine and fine and common medium roots; common fine and medium pores; noneffervescent; neutral; clear smooth boundary. (7 to 18 inches thick)

Bt—11 to 24 inches; 60 percent reddish brown (5YR 5/4) and 40 percent reddish yellow (5YR 6/8) sandy clay loam, reddish brown (5YR 4/4) and yellowish red (5YR 5/8) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; common very fine and fine and few medium roots; common very fine and fine pores; many distinct clay films on faces of peds; few fine iron-manganese concretions; few rounded pebbles; noneffervescent; slightly alkaline; clear smooth boundary. (8 to 49 inches thick)

Btk1—24 to 39 inches; 55 percent red (2.5YR 5/8) and 40 percent red (2.5YR 4/6) clay loam, red (2.5YR 4/8) and dark red (2.5YR 3/6) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; common very fine and fine roots; common very fine and few fine pores;

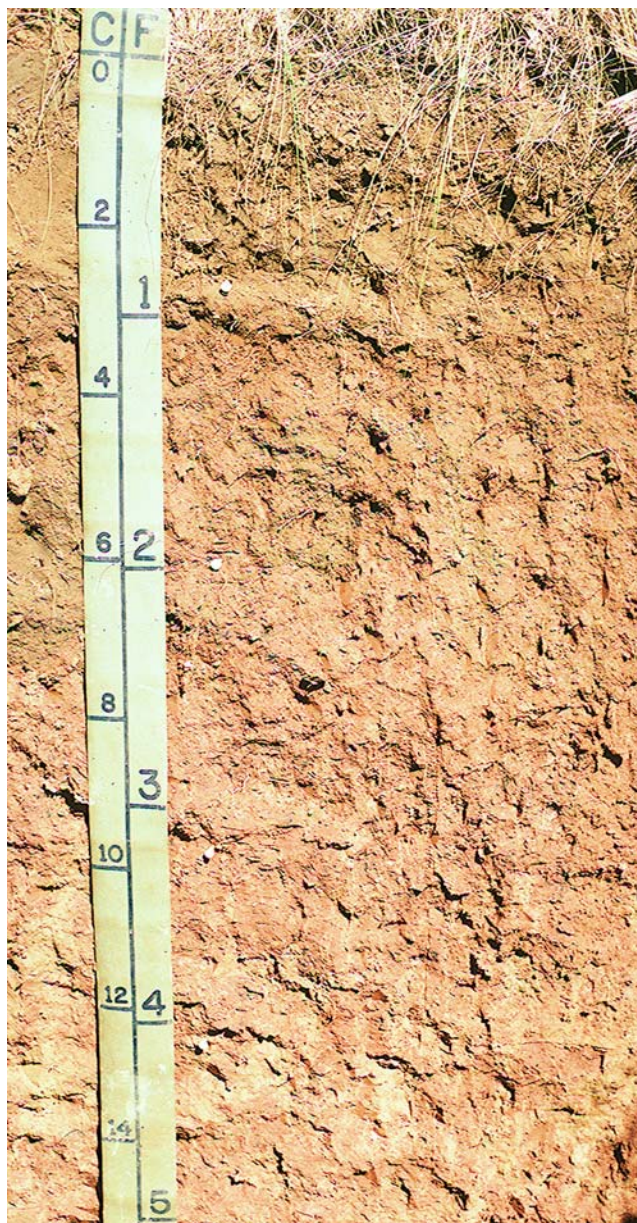


Figure 13.—Profile of Ozark fine sandy loam. Redoximorphic features are below a depth of about 3 feet. The left side of the scale is in centimeters times 10, and the right side is in feet.

many distinct clay films on faces of peds; few fine iron-manganese concretions; common medium prominent pale brown (10YR 6/3) iron depletions; common fine and medium masses and few fine and medium calcium carbonate concretions; very slightly effervescent; moderately alkaline; gradual smooth boundary.

Btk2—39 to 50 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; few very fine and fine roots; few very fine and fine pores; common distinct clay films on faces of peds; common fine and medium iron-manganese concretions; common fine prominent light greenish gray (5GY 7/1) iron depletions; few fine and medium calcium carbonate concretions; few films of

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calcium carbonate on faces of peds; few masses of salt; slightly effervescent; moderately alkaline; gradual smooth boundary.

- Btk3—50 to 59 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; few very fine and fine roots; few very fine and fine pores; common distinct clay films on faces of peds; common fine and medium iron-manganese concretions; common fine prominent light greenish gray (5GY 7/1) iron depletions and common fine and medium faint red (2.5YR 5/8) iron concentrations; few fine and medium concretions and few films of calcium carbonate on faces of peds; few masses of salt; slightly effervescent; moderately alkaline; gradual smooth boundary. (Combined thickness of the Btk horizons ranging from 10 to 40 inches)
- BC—59 to 83 inches; red (2.5YR 5/8) sandy clay loam, red (2.5YR 4/8) moist; weak coarse and very coarse prismatic structure; hard, friable; very few very fine and fine roots; few very fine and fine pores; common fine and medium iron-manganese concretions; few films of calcium carbonate on faces of peds; slightly effervescent; moderately alkaline; gradual wavy boundary. (0 to 30 inches thick)
- 2C—83 to 105 inches; red (2.5YR 5/8), stratified clay loam, red (2.5YR 4/8) moist; massive; slightly effervescent; moderately alkaline; abrupt smooth boundary. (0 to 50 inches thick)
- 2Cd—105 to 110 inches; red (2.5YR 4/6) siltstone with few greenish gray spots; very slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to lithologic discontinuity: 60 to more than 80 inches

Depth to a perched water table: 3.3 to 5.0 feet, mainly from October to May

Depth to secondary calcium carbonates: 10 to 50 inches

Thickness of the mollic epipedon: 10 to 20 inches

Particle-size control section (weighted average):

Clay content—20 to 35 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 5YR to 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3

Texture—fine sandy loam or sandy loam

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

Upper part of the Bt horizon:

Color—hue of 5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—sandy clay loam or clay loam

Calcium carbonate equivalent—0 to 5 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—0 to 2 percent

Sodium adsorption ratio (SAR)—0 to 6

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral or slightly alkaline

Lower part of the Bt horizon and the Btk horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6

Texture—clay loam, sandy clay loam, loam, sandy clay, or clay

Redoximorphic depletions—in some pedons, light gray iron depletions below a depth of 30 inches

Calcium carbonate equivalent—0 to 15 percent

Visible secondary carbonates—0 to 10 percent

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Electrical conductivity (EC)—dS/m of 0 to 4
Gypsum content—0 to 5 percent
Sodium adsorption ratio (SAR)—0 to 12
Effervescence—noneffervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

BC and C horizons (where present):

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6
Texture—clay loam, sandy clay loam, fine sandy loam, or loam
Calcium carbonate equivalent—2 to 10 percent
Electrical conductivity (EC)—dS/m of 0 to 4
Gypsum content—0 to 5 percent
Sodium adsorption ratio (SAR)—0 to 12
Effervescence—very slightly effervescent to strongly effervescent
Reaction—moderately alkaline

2BC and 2C horizons (where present):

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 or 6
Texture—clay loam, silty clay loam, silty clay, or clay weathered from Permian-age red-bed sediments
Clay content—30 to 50 percent
Calcium carbonate equivalent—2 to 15 percent
Electrical conductivity (EC)—dS/m of 0 to 4
Gypsum content—0 to 5 percent
Sodium adsorption ratio (SAR)—0 to 12
Effervescence—very slightly effervescent to strongly effervescent
Reaction—moderately alkaline

2Cd horizon:

Color—hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4 to 6
Texture—noncemented siltstone and claystone of Permian-age red beds that have texture of clay or silty clay
Depth to this horizon—5 to 12 feet
Clay content—40 to 60 percent
Calcium carbonate equivalent—1 to 8 percent
Electrical conductivity (EC)—dS/m of 1 to 8
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—0 to 8
Effervescence—noneffervescent to slightly effervescent
Reaction—slightly alkaline or moderately alkaline

A saline phase is recognized for pedons that have electrical conductivity of 4 to 25 dS/m in the surface layer and have a pH that ranges to strongly alkaline in horizons below the surface layer.

Roark Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Alluvial sediments of late Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

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Landform: Terraces

Position: Treads

Slope: 0 to 3 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine, mixed, superactive, thermic Pachic Argiustolls

Associated Soils

These are soils of the Frankirk, Grandfield, Grandmore, Madge, Tipton, and Ozark series. Frankirk soils are in the more sloping areas and have a mollic epipedon that is that is less than 20 inches thick. Grandfield and Grandmore soils are in the higher landscape positions, have an ochric epipedon, and have a fine-loamy particle-size control section. Madge, Tipton, and Ozark soils are in landscape positions similar to those of the Roark soils. They have a fine-loamy particle-size control section. Also, Madge and Ozark soils have a mollic epipedon that is less than 20 inches thick.

Typical Pedon

Roark loam, on a slope of 0.5 percent in an area of cropland; Jackson County, Oklahoma; from the intersection of U.S. Highways 62 and 283 in Altus, 6 miles north on U.S. Highway 283, about 2 miles west and 1 mile north on a county road, 1,600 feet west on a county road, and 50 feet south in cropland; 50 feet south and 1,600 feet west of the northeast corner of sec. 14, T. 3 N., R. 21 W.; USGS quadrangle—Altus; latitude—34 degrees, 44 minutes, 22 seconds N.; longitude—99 degrees, 22 minutes, 29 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- Ap—0 to 10 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; moderate fine and medium granular structure; slightly hard, very friable; few fine roots; few fine pores; noneffervescent; neutral; clear smooth boundary. (8 to 17 inches thick)
- Bt—10 to 24 inches; brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate medium and coarse prismatic structure parting to moderate and strong medium subangular blocky; hard, firm; few very fine and fine roots; few fine pores; common distinct clay films on faces of peds and in pores; noneffervescent; slightly alkaline; clear smooth boundary. (8 to 44 inches thick)
- Btk1—24 to 34 inches; brown (7.5YR 5/3) clay loam, brown (7.5YR 4/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; few fine roots; few fine pores; many distinct clay films on faces of peds and in pores; common fine and medium concretions and few fine and medium masses of calcium carbonate; slightly effervescent; moderately alkaline; gradual smooth boundary.
- Btk2—34 to 49 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; few fine roots; few fine pores; common distinct clay films on faces of peds; common fine and medium concretions and common fine and medium masses of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Btk3—49 to 67 inches; reddish yellow (7.5YR 7/6) loam, reddish yellow (7.5YR 6/6) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; few fine roots; few fine pores; common faint clay films on faces of peds; common fine and medium distinct yellowish red (5YR 5/8) iron concentrations and common fine and medium prominent dark grayish brown (10YR 4/2) iron depletions; common fine and medium concretions and few fine

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and medium masses of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary. (Combined thickness of the Btk horizons ranging from 10 to 50 inches)

2C—67 to 80 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; massive; very hard, firm; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to 80 inches

Depth to secondary calcium carbonates: 20 to 40 inches

Depth to redoximorphic depletions: 40 to 60 inches

Thickness of the mollic epipedon: More than 20 inches

Particle-size control section (weighted average):

Clay content—35 to 45 percent

CEC/clay ratio—0.6 or more

A horizon:

Color—hue of 7.5YR or 10YR, value of 4 (3 moist), and chroma of 2 or 3

Texture—loam or clay loam

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—0 to 2 percent

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

Bt horizon:

Color—hue of 5YR to 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 or 3

Texture—clay loam, silty clay loam, or clay

Calcium carbonate equivalent—0 to 5 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—0 to 2 percent

Sodium adsorption ratio (SAR)—0 to 2

Effervescence—noneffervescent to slightly effervescent

Reaction—slightly alkaline or moderately alkaline

Btk horizon:

Color—hue of 5YR to 10YR, value of 4 to 7 (3 to 6 moist), and chroma of 2 to 6

Texture—clay loam, silty clay loam, or clay; also, sandy clay loam or loam below a depth of 40 inches

Redoximorphic accumulations—0 to 5 percent

Redoximorphic depletions—0 to 5 percent

Calcium carbonate equivalent—1 to 10 percent

Visible secondary carbonates—0 to 5 percent concretions and masses

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 2 percent

Sodium adsorption ratio (SAR)—0 to 6

Effervescence—slightly effervescent to violently effervescent

Reaction—moderately alkaline

BC or BCK horizon (where present):

Color—hue of 5YR to 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 6

Texture—loam, clay loam, sandy clay loam, fine sandy loam, or silty clay loam

Redoximorphic accumulations—0 to 5 percent

Redoximorphic depletions—0 to 5 percent

Calcium carbonate equivalent—1 to 15 percent

Visible secondary carbonates—0 to 10 percent concretions and masses

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 2 percent

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Sodium adsorption ratio (SAR)—0 to 6
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

2C horizon:

Color—hue of 5YR to 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 6
Texture—silty clay loam to loamy sand; stratified in some pedons
Redoximorphic accumulations—0 to 5 percent
Redoximorphic depletions—0 to 5 percent
Calcium carbonate equivalent—1 to 5 percent
Electrical conductivity (EC)—dS/m of 0 to 8
Gypsum content—0 to 4 percent
Sodium adsorption ratio (SAR)—0 to 6
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

Rups Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Somewhat poorly drained

Flooding: Frequently flooded or occasionally flooded for very brief periods, mainly during the spring and summer months

Parent material and geologic age: Silty, saline alluvium of Recent age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Flood plains

Slope: 0 to 1 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-silty, mixed, superactive, thermic Oxyaquic Haplustolls

Associated Soils

These are soils of the Hollister, La Casa, Roark, Spur, Tillman, Tilvern, and Westill series. Hollister soils have a mollic epipedon that is more than 20 inches thick, have a fine textured particle-size control section, and are in the higher areas on terraces. La Casa, Roark, Tillman, and Westill soils have an argillic horizon and a fine textured particle-size control section and are in the higher areas on terraces and uplands. Spur soils are on flood plains. Tilvern soils have an ochric epipedon and a fine textured particle-size control section and are in the higher areas on uplands.

Typical Pedon

Rups silty clay loam, in an area of rangeland; Jackson County, Oklahoma; from the intersection of U.S. Highways 283 and 62 in Altus, 5 miles south on U.S. 283, about 3.5 miles east on a county road, and 300 feet south in rangeland; 300 feet south and 2,450 feet east of the northwest corner of sec. 14, T. 1 N., R. 20 W.; latitude—34 degrees, 33 minutes, 52 seconds N.; longitude—99 degrees, 16 minutes, 22 seconds W.; USGS quadrangle—Altus SE, Oklahoma; NAD 1927.

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(Colors are for dry soil unless otherwise indicated.)

- A1—0 to 8 inches; reddish brown (5YR 4/3) silty clay loam, dark reddish brown (5YR 3/3) moist; moderate fine and medium granular structure; hard, friable; many very fine and fine and common medium roots; many very fine and fine and few medium pores; slightly saline; slightly effervescent; slightly alkaline; clear smooth boundary.
- A2—8 to 15 inches; reddish brown (5YR 4/3) silty clay loam, dark reddish brown (5YR 3/3) moist; moderate fine subangular blocky structure parting to moderate fine and medium granular; hard, friable; many very fine and fine and few medium roots; many very fine and fine and few medium pores; common fine and medium faint reddish brown (5YR 4/4) concentrations; common fine and medium iron-manganese concretions; few fine salt masses; moderately saline; slightly effervescent; moderately alkaline; gradual smooth boundary. (Combined thickness of the A horizons ranging from 7 to 17 inches)
- Bkz1—15 to 30 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; common very fine and fine and few medium roots; common very fine and fine and few medium pores; common fine and medium iron-manganese concretions; few fine and medium masses and few fine and medium concretions of calcium carbonate; common fine salt masses; strongly saline; common fine and medium prominent brown (7.5YR 4/3) (moist) iron depletions; strongly effervescent; moderately alkaline; gradual smooth boundary.
- Bkz2—30 to 48 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; few very fine and fine roots; common very fine and fine and few medium pores; common fine and medium iron-manganese concretions; few fine and medium masses and few fine and medium concretions of calcium carbonate; common fine salt masses; strongly saline; strongly effervescent; moderately alkaline; clear smooth boundary. (Thickness of the B horizons ranging from 15 to 53 inches)
- Ckz—48 to 60 inches; stratified with 60 percent yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist, and 40 percent reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; very hard, firm; common very fine and fine pores; few fine and medium iron-manganese concretions; few fine and medium masses and few fine and medium concretions of calcium carbonate; few fine salt masses; strongly saline; 3 percent gravel; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 18 inches

Depth to secondary calcium carbonates: 7 to 35 inches

Depth to salt accumulations: 0 to 20 inches

Depth to redoximorphic concentrations: 7 to 40 inches

Depth to redoximorphic depletions: 15 to 40 inches

Depth to endosaturation: 1.5 to 3.3 feet during the months of October through May in most years

Particle-size control section (weighted average):

Clay content—25 to 35 percent

Sand content—5 to 40 percent total sand, 3 to 15 percent fine sand or coarser sand

CEC/clay ratio—0.6 or more

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A horizon:

Color—hue of 5YR or 7.5YR, value of 4 (3 moist), and chroma of 2 or 3
Texture—silty clay loam or clay loam
Calcium carbonate equivalent—0 to 5 percent
Electrical conductivity (EC)—dS/m of 4 to 20
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—0 to 4
Effervescence—very slightly effervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

B horizon:

Color—hue of 5YR to 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 6
Texture—silty clay loam, clay loam, silt loam, silty clay, or clay (textures with more than 35 percent clay occurring below a depth of 35 inches)
Redoximorphic accumulations—few or common
Redoximorphic depletions—few or common
Calcium carbonate equivalent—3 to 15 percent
Visible secondary carbonates—few or common fine and medium masses and/or concretions
Electrical conductivity (EC)—dS/m of 8 to 30
Gypsum content—1 to 5 percent
Sodium adsorption ratio (SAR)—0 to 13
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

C horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 1 to 6
Texture—silty clay loam, clay loam, silty clay, or clay
Redoximorphic accumulations—few or common
Redoximorphic depletions—few or common
Content of rock fragments, by volume—in some pedons, strata that have as much as 25 percent gravel-sized fragments of shale or quartzite
Calcium carbonate equivalent—3 to 15 percent
Visible secondary carbonates—few or common fine and medium masses and/or concretions
Electrical conductivity (EC)—dS/m of 8 to 30
Gypsum content—1 to 5 percent
Sodium adsorption ratio (SAR)—0 to 13
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

Spikebox Series

Major land resource area: Central Rolling Red Plains, Eastern Part (78C)

Depth class: Shallow or very shallow

Drainage class: Well drained

Parent material and geologic age: Residuum derived from extremely weakly cemented to moderately cemented sandstone interbedded with thin strata of clay and shale, mainly of the San Angelo Formation of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Uplands

Landform: Hills

Position: Interfluves, nose slopes, and side slopes

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Slope: 1 to 12 percent

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Thornthwaite PE index: 34 to 44

Taxonomic classification: Loamy, mixed, active, thermic, shallow Typic Haplustepts

Associated Soils

These are soils of the Cobb, Cosh, Decobb, Knoco, Tilvern, and Vernon series. Cosh soils have an argillic horizon and are in landscape positions similar to those of the Spikebox soils. Cobb and Decobb soils are more than 20 inches deep to sandstone bedrock, have an argillic horizon, and occur in the lower landscape positions. Knoco soils are clayey in the textural control section and are in landscape positions similar to those of the Spikebox soils. Tilvern and Vernon soils are more than 20 inches deep to claystone bedrock and are clayey in the textural control section.

Typical Pedon

Spikebox fine sandy loam, on a slope of 4 percent in an area of cropland; Jackson County, Oklahoma; from the intersection of U.S. Highways 283 and 62 in Altus, about 8 miles south, 0.56 mile west, and about 2,350 feet south in cropland; about 2,350 feet south and 2,300 feet east of the northwest corner of sec. 31, T. 1 N., R. 20 W.; latitude—34 degrees, 30 minutes, 54 seconds N.; longitude—99 degrees, 20 minutes, 36 seconds W.; USGS quadrangle—Altus SE; NAD 1927.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 6 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak fine and medium granular structure; hard, very friable; common very fine and fine roots; very slightly effervescent; moderately alkaline; abrupt smooth boundary. (4 to 13 inches thick)

BC—6 to 13 inches; red (2.5YR 5/6) fine sandy loam, red (2.5YR 4/6) moist; weak fine and medium subangular blocky structure; hard, friable; few very fine and fine roots; few fine and medium pores; 5 percent paragravel of sandstone as much as 1 inch across the long axis; slightly effervescent; moderately alkaline; abrupt smooth boundary. (6 to 10 inches thick)

Cr1—13 to 24 inches; light greenish gray (5GY 7/1), extremely weakly cemented sandstone, greenish gray (5GY 6/1) moist; massive; slightly effervescent; moderately alkaline; abrupt smooth boundary.

Cr2—24 to 40 inches; red (2.5YR 4/6), very weakly cemented sandstone, dark red (2.5YR 3/6) moist; massive; a few strata of dark red (2.5YR 3/6) shale less than 5 inches thick; very slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 8 to 20 inches

Depth to paralithic contact: 8 to 20 inches

Calcium carbonate equivalent: 0 to 15 percent

Particle-size control section (weighted average):

Clay content—8 to 20 percent

Content of rock fragments—0 to 10 percent sandstone paragravel or siliceous gravel

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6

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Texture—fine sandy loam or loam

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

BC or B/C horizon:

Color—hue of 2.5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 to 6

Texture—fine sandy loam, very fine sandy loam, or loam

Electrical conductivity (EC)—dS/m of 0 to 2

Gypsum content—0 to 2 percent

Effervescence—very slightly effervescent to strongly effervescent

Reaction—moderately alkaline

Cr horizon:

Color—hue of 10R to 5GY, value of 4 to 8 (3 to 7 moist), and chroma of 1 to 8

Kind of rock—extremely weakly cemented to moderately cemented, stratified sandstone that is interbedded with thin layers of clay or shale

Moist bulk density (g/cc)—1.85 to 2.35

Excavation difficulty—moderate or high

Effervescence—very slightly effervescent to strongly effervescent

Reaction—moderately alkaline

Springer Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy and sandy alluvial and eolian sediments of Pleistocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Sand sheets

Position: Dunes and interdune areas

Slope: 0 to 10 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 30 to 44

Taxonomic classification: Coarse-loamy, mixed, active, thermic Typic Paleustalfs

Associated Soils

These are soils of the Delwin, Devol, Eda, Grandfield, Grandmore, Headrick, Heatly, Miles, Nobscot, and Ozark series. Delwin, Grandfield, Grandmore, Heatly, and Miles soils are in landscape positions similar to those of the Springer soils or in slightly lower positions. They have more than 18 percent clay in the particle-size control section. Devol soils are in landscape positions similar to those of the Springer soils and do not have buried horizons within a depth of 60 inches. Eda soils occur in the higher landscape positions, do not have an argillic horizon, and are sandy throughout. Headrick and Ozark soils occur in the lower landscape positions, have more than 18 percent clay in the particle-size control section, and have a water table in the lower part. Nobscot soils are in landscape positions similar to those of the Springer soils and have a sandy epipedon more than 20 inches thick.

Typical Pedon

Springer loamy fine sand, in an area of pasture; Kent County, Texas; from Texas Highway 70 about 1 mile south of Jayton, about 4.6 miles southwest on U.S. Highway 380 to a roadside park, then 300 feet southeast in the pasture.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 16 inches; light brown (7.5YR 6/4) loamy fine sand, brown (7.5YR 5/4) moist; structureless; loose; few fine roots; few fine waterworn pebbles; neutral; clear smooth boundary. (8 to 20 inches thick)
- Bt1—16 to 30 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak coarse prismatic and weak medium subangular blocky structure; slightly hard, very friable; few fine roots; few pockets of sandy clay loam; sand grains bridged with clay films; few fine pebbles; slightly alkaline; gradual smooth boundary. (10 to 32 inches thick)
- Bt2—30 to 42 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure; slightly hard, very friable; few pockets of sandy clay loam; sand grains bridged with clay films; few clean sand grains; moderately alkaline; gradual smooth boundary. (0 to 24 inches thick)
- Eb—42 to 56 inches; reddish yellow (5YR 6/6) loamy fine sand, yellowish red (5YR 5/6) moist; structureless; few pockets of clean sand grains; moderately alkaline; clear smooth boundary. (0 to 20 inches thick)
- Btb—56 to 72 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; hard, very friable; few pockets of sandy clay loam; bridged and coated sand grains; moderately alkaline; diffuse wavy boundary. (6 to 20 inches thick)
- BCb—72 to 84 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; weak medium subangular blocky structure; soft, very friable; few pockets of clean sand grains; few bands and pockets of sandy clay loam; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to secondary calcium carbonates: More than 40 inches

Depth to a buried horizon: 40 to 60 inches

Particle-size control section (weighted average):

Clay content—8 to 18 percent

Sand content—50 to 85 percent

Content of rock fragments—0 to 3 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 5YR to 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 2 to 4

Texture—fine sand, loamy fine sand, loamy sand, or fine sandy loam

Effervescence—noneffervescent

Reaction—moderately acid to slightly alkaline

Bt horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 8

Texture—fine sandy loam or sandy loam; also includes loamy sand or loamy fine sand in the lower part

Clay content—6 to 18 percent

Clay films—sand grains coated and bridged with clay; clay films may occur.

Content of rock fragments—0 to 3 percent, by volume

Effervescence—noneffervescent

Reaction—slightly acid to moderately alkaline

BC or Eb horizon (where present):

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 8

Texture—fine sandy loam, sandy loam, loamy fine sand, loamy sand, or fine sand

Clay content—2 to 12 percent

Content of rock fragments—0 to 3 percent, by volume

Effervescence—noneffervescent

Reaction—neutral to moderately alkaline

Btb horizon:

Color—hue of 5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 8

Texture—sandy loam, fine sandy loam, very fine sandy loam, or sandy clay loam

Clay content—10 to 25 percent

Clay films—sand grains are coated and bridged with clay; clay films may occur.

Content of rock fragments—0 to 3 percent, by volume

Calcium carbonate equivalent—0 to 5 percent

Visible secondary carbonates—some films, threads, or soft bodies of calcium carbonate at a depth of more than 40 inches in some pedons

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

BCb horizon:

Color—hue of 5YR or 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 8

Texture—fine sandy loam, loamy fine sand, loamy sand, or fine sand

Clay content—2 to 12 percent

Content of rock fragments—0 to 3 percent, by volume

Calcium carbonate equivalent—0 to 5 percent

Visible secondary carbonates—some films, threads, or soft bodies of calcium carbonate at a depth of more than 40 inches in some pedons

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

Spur Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Flooding: Frequently flooded to rarely flooded for very brief periods during the months of April through October

Parent material: Loamy alluvial sediments

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains and uplands

Landform: Flood plains

Slope: 0 to 2 percent

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, superactive, thermic Fluventic Haplustolls

Associated Soils

These are soils of the Colorado, Gageby, and Rups series. These soils are in the same landscape positions as the Spur soils. Colorado soils do not have a mollic epipedon or a cambic horizon. Gageby soils have a mollic epipedon that is more than 20 inches thick. Rups soils have a fine-silty textural control section and have electrical conductivity of more than 4 dS/m throughout.

Typical Pedon

Spur clay loam, in an area of pasture; Fisher County, Texas; from Texas Highway 70 in Roby, 3.5 miles west on U.S. Highway 180, about 0.8 mile south and 0.4 mile west on a county road, and 100 feet north in the pasture.

(Colors are for dry soil unless otherwise indicated.)

A—0 to 15 inches; brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate medium granular structure; hard, friable; many fine roots; many fine and medium pores; many wormcasts; strongly effervescent; moderately alkaline; gradual smooth boundary. (11 to 20 inches thick)

Bk1—15 to 38 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky and moderate fine granular structure; hard, friable; numerous strata of slightly darker material $\frac{1}{2}$ to 1 inch thick; many fine roots and pores; many wormcasts; few films, threads, and fine concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary. (10 to 30 inches thick)

Bk2—38 to 50 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; hard, friable; few threads, films, and fine concretions of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary. (8 to 20 inches thick)

Bk3—50 to 60 inches; light reddish brown (5YR 6/4) clay loam, reddish brown (5YR 5/4) moist; weak fine subangular blocky structure; hard, friable; few fine concretions of calcium carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches

Particle-size control section (weighted average):

Clay content—20 to 35 percent

CEC/clay ratio—0.6 or more

A horizon:

Color—hue of 5YR to 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 4

Texture—clay loam, loam, or fine sandy loam

Clay content—12 to 35 percent

Calcium carbonate equivalent—0 to 2 percent

Effervescence—noneffervescent to slightly effervescent

Reaction—moderately alkaline

Upper part of the B horizon:

Color—hue of 5YR to 10YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 to 6

Texture—loam, sandy clay loam, or clay loam

Clay content—20 to 35 percent

Calcium carbonate equivalent—2 to 10 percent

Visible secondary carbonates—in some pedons, none; in other pedons, few films, threads, or fine concretions

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline

Lower part of the B horizon:

Color—hue of 5YR or 7.5YR, value of 5 to 7 (4 to 6 moist), and chroma of 3 to 6
Texture—loam, clay loam, or sandy clay loam
Clay content—20 to 35 percent
Calcium carbonate equivalent—2 to 10 percent
Visible secondary carbonates—few or common films, threads, and fine concretions
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

C horizon (where present):

Color—hue of 5YR or 7.5YR, value of 5 to 7 (4 to 6 moist), and chroma of 4 to 6
Texture—strata of loam, sandy loam, clay loam, or sandy clay loam
Clay content—15 to 35 percent
Calcium carbonate equivalent—2 to 10 percent
Visible secondary carbonates—few or common films, threads, and fine concretions
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

Talpa Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C); Rolling Limestone Prairie (78A)

Depth class: Very shallow or shallow

Drainage class: Well drained

Parent material and geologic age: Residuum of dolomitic limestone of Permian age (fig. 14)

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Karstland and uplands

Landform: Hills and escarpments

Position: Interfluves and side slopes

Slope: 1 to 30 percent

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 57 to 66 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Loamy, mixed, superactive, thermic Lithic Calciustolls

Associated Soils

These are soils of the Aspermont, Cho, Cornick, Cottonwood, Foursixes, Kavett, Knoco, Lueders, Owens, Quanah, Quinlan, Valera, Vernon, and Vinson series. Aspermont soils are in the lower landscape positions and have a solum that is more than 20 inches thick. Cho, Cornick, Cottonwood, and Vinson soils are in landscape positions similar to those of the Talpa soils and do not have a lithic contact. Foursixes, Kavett, and Valera soils are fine textured and are in the smoother, slightly lower areas. Knoco, Owens, and Vernon soils are in the lower sloping areas and formed in material weathered from clayey shale. Lueders soils are on side slopes and have carbonatic mineralogy. Quanah soils have a solum that is more than 60 inches thick and are on footslopes. Quinlan soils have a cambic horizon, are underlain by sandstone, and are in landscape positions similar to those of the Talpa soils.



Figure 14.—Profile of Talpa loam in a road cut. The depth to limestone bedrock is about 10 inches.

Typical Pedon

Talpa gravelly loam, in an area of native range; King County, Texas; from the courthouse in Guthrie, 13.5 miles north on U.S. Highway 83, about 3.2 miles east on Farm Road 1168, about 3.0 miles east on Farm Road 3416 to a ranch road, 2.75 miles southeast on ranch road, 4.1 miles south on ranch road, 0.85 mile west on oil field road, and 0.17 mile south and 120 feet east of road in rangeland; USGS quadrangle—J Y Ranch; latitude—33 degrees, 43 minutes, 53 seconds N; longitude—100 degrees, 13 minutes, 34 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- A1—0 to 4 inches; brown (10YR 4/3) gravelly loam; dark brown (10YR 3/3) moist; moderate very fine and fine subangular blocky and granular structure; hard, firm; many fine and medium roots; common fine and medium pores; common wormcasts and insect burrows; about 15 percent, by volume, limestone fragments 2 to 5 centimeters across the long axis; strongly effervescent; moderately alkaline; clear smooth boundary. (3 to 8 inches thick)
- A2—4 to 9 inches; brown (7.5YR 4/3) gravelly loam, dark brown (7.5YR 3/3) moist; moderate very fine and fine subangular blocky and granular structure; hard, firm; common fine and medium roots; common fine and medium pores; few worm

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- channels and wormcasts; about 20 percent, by volume, limestone fragments 2 to 5 centimeters across the long axis; secondary coatings of calcium carbonate on the lower side of some fragments; strongly effervescent; moderately alkaline; abrupt wavy boundary. (0 to 13 inches thick)
- C & A—9 to 11 inches; very pale brown (10YR 8/2) and pink (7.5YR 8/4), strongly cemented, reprecipitated calcium carbonate, 1 to 8 centimeters thick, surrounding light gray (10YR 7/2), broken limestone fragments; this material making up 90 percent of the layer and loamy material, 2 millimeters to 2 centimeters thick, making up 10 percent; many fine and medium roots; common fine calcium carbonate concretions; discontinuous and fractured coatings of reprecipitated calcium carbonate as much as 2 centimeters thick on the bedrock and in some cracks and crevices in the bedrock; strongly effervescent; moderately alkaline; abrupt wavy boundary. (0 to 3 inches thick)
- R—11 to 53 inches; very pale brown (10YR 8/2), indurated, fractured limestone; fractures as much as 2 centimeters wide and 1 to 2 feet apart; most cracks filled with reprecipitated calcium carbonate, others containing soil and roots; slightly effervescent; moderately alkaline; abrupt smooth boundary. (10 to 60 inches thick)
- Cd1—53 to 71 inches; olive gray (5Y 5/2) shale with clay texture, olive gray (5Y 4/2) moist; massive; rock structure with many fractures; few weak red (10R 4/3) streaks; few masses of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary. (14 to 24 inches thick)
- Cd2—71 to 80 inches; weak red (10R 4/3) shale with clay texture, dusky red (10R 3/3) moist; massive; rock structure with many fractures; few masses of calcium carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 4 to 20 inches

Depth to lithic contact: 4 to 20 inches

Particle-size control section (weighted average):

Content of rock fragments—10 to 35 percent limestone gravel and 5 to 20 percent limestone cobbles and stones

CEC/clay ratio—0.6 or more

A horizon:

Color—hue of 5YR to 2.5Y, value of 3 to 5 (2 to 4 moist), and chroma of 2 or 3

Texture—clay loam, silty clay loam, loam, or the gravelly analogs of these textures

Clay content—20 to 35 percent

Content of rock fragments (dolomitic limestone or limestone fragments coated with calcium carbonate), by volume—5 to 20 percent in the A1 horizon and 15 to 35 percent in the A2 horizon

Calcium carbonate equivalent—10 to 40 percent

Effervescence—strongly effervescent or violently effervescent

Reaction—moderately alkaline

C & A horizon (where present):

Color—hue of 5YR to 2.5Y, value of 3 to 5 (2 to 4 moist), and chroma of 2 or 3

Texture—clay loam, silty clay loam, or loam

Content of rock fragments, by volume—80 to 95 percent limestone fragments

Effervescence—strongly effervescent or violently effervescent

Reaction—moderately alkaline

R horizon:

Kind of rock—indurated and fractured dolomitic limestone

Excavation difficulty—very high or extremely high

Cd horizon:

Color—hue of 10R, 2.5YR, 5Y, or 5GY; value of 4 to 6; and chroma of 1 to 6

Kind of rock—stratified shale

Tillman Series

Major land resource area: Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Loamy and clayey alluvium of Pleistocene age
over red-bed clays and claystone sediments of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces

Position: Treads

Slope: 0 to 5 percent

Mean annual precipitation: 23 to 28 inches

Mean annual air temperature: 57 to 65 degrees F

Thornthwaite PE index: 33 to 44

Taxonomic classification: Fine, mixed, superactive, thermic Vertic Paleustolls

Associated Soils

These are soils of the Deandale, Hollister, Tilvern, Vernon, and Wichita series. Deandale and Hollister soils have a mollic epipedon that is more than 20 inches thick, have smectitic mineralogy, and are in the slightly lower landscape positions. Tilvern and Vernon soils are on the higher parts of the landscape, have an ochric epipedon, and have a solum that is less than 60 inches thick. Wichita soils have an ochric epipedon and are in the slightly lower landscape positions.

Typical Pedon

Tillman loam, in an area of rangeland; Wilbarger County, Texas; from the intersection of Farm Road 433 and U.S. Highway 70 in Lockett, 3.6 miles southwest on U.S. Highway 70, about 5.0 miles south on Farm Road 1207, about 0.05 mile west on a county road, 4.9 miles south, 0.1 mile southwest, and 5.3 miles southeast and south to a gate to a fenced enclosure, 160 feet east from gate into the rangeland enclosure; latitude—33 degrees, 53 minutes, 15 seconds N.; longitude 99 degrees, 19 minutes, 26 seconds W.; USGS quadrangle—Santa Rosa Lake, Texas; NAD 1927.

(Colors are for dry soil unless otherwise indicated.)

A—0 to 4 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist and crushed; moderate fine and medium subangular blocky structure; hard, friable; common fine and medium roots; common fine and medium pores; few wormcasts and worm channels; few fine siliceous pebbles; slightly acid; clear smooth boundary. (4 to 16 inches thick)

Bt1—4 to 12 inches; reddish brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist and crushed; weak fine subangular blocky structure; very hard, firm; common fine and medium roots; common fine and medium pores; few wormcasts and worm channels; few faint clay films on faces of peds; few fine siliceous pebbles; neutral; clear smooth boundary. (6 to 12 inches thick)

Bt2—12 to 18 inches; reddish brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium

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- angular blocky; very hard, very firm; common fine roots; few wormcasts and worm channels; common distinct clay films on faces of prisms; few fine black concretions; reversible trans-horizon cracks extending through the lower boundary; slightly alkaline; gradual smooth boundary. (6 to 12 inches thick)
- Bt3—18 to 28 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; strong coarse angular blocky structure parting to moderate medium angular blocky; extremely hard, very firm; few fine roots, mainly between ped; few worm channels; common distinct clay films on faces of peds are 1 chroma darker than the soil matrix; common fine and medium concretions of calcium carbonate; few black masses and fine concretions; reversible trans-horizon cracks extending through the lower boundary; noneffervescent; moderately alkaline; gradual wavy boundary. (10 to 20 inches thick)
- Btk1—28 to 47 inches; yellowish red (5YR 5/6) clay, yellowish red (5YR 4/6) moist; moderate coarse prismatic structure parting to moderate medium angular blocky; extremely hard, very firm; few fine roots; common distinct dark reddish brown (2.5YR 3/3) clay films on faces of peds; common fine and medium concretions of calcium carbonate; few black masses and fine concretions; reversible trans-horizon cracks extending through the lower boundary; strongly effervescent; moderately alkaline; diffuse wavy boundary. (8 to 20 inches thick)
- Btk2—47 to 74 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) and yellowish red (5YR 4/6) moist; moderate medium prismatic structure parting to medium angular blocky; very hard, very firm; few fine roots; few fine pores; common distinct weak red (10R 4/3) clay films on faces of prisms; common fine and medium concretions of calcium carbonate; common black masses and few fine black concretions; strongly effervescent; moderately alkaline; diffuse smooth boundary. (12 to 30 inches thick)
- Bck—74 to 88 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) moist; weak coarse prismatic structure; very hard, very firm; few fine roots; few dark clay films on faces of prisms; soil weathering mainly confined to prism faces, becoming massive toward the center of prisms; few fine and medium concretions of calcium carbonate; few fine siliceous pebbles; few black masses and fine concretions; strongly effervescent; moderately alkaline; diffuse smooth boundary. (0 to 18 inches thick)
- Cd—88 to 106 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) moist; massive; very hard, very firm; weakly stratified and fractured; few reddish brown coatings on faces of fractures; common reddish brown (2.5YR 5/4) clay masses; few fine and medium concretions of calcium carbonate; few fine black concretions; few fragments of claystone; few fine siliceous pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 60 to more than 80 inches

Depth to secondary calcium carbonates: 0 to 24 inches

Depth to a calcic horizon (where present): More than 40 inches

Thickness of the mollic epipedon: 10 to 20 inches; generally extending into the argillic horizon

Vertic features: COLE of more than 0.06 in the upper 40 inches; cracks, 5 millimeters or more wide, extending from the surface to a depth of 2 feet or more

Particle-size control section (weighted average):

Clay content—35 to 50 percent

Content of rock fragments—0 to 5 percent

CEC/clay ratio—0.6 or more

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A horizon:

Color—hue of 5YR to 10YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 or 3
Texture—loam, silt loam, silty clay loam, or clay loam (fig. 15)
Clay content—18 to 35 percent; averaging 30 percent or less
Calcium carbonate equivalent—0 to 2 percent
Electrical conductivity (EC)—dS/m of 0 to 2
Sodium adsorption ratio (SAR)—0 to 1
Effervescence—noneffervescent to slightly effervescent
Reaction—slightly acid to moderately alkaline

Bt horizon:

Color—hue of 2.5YR or 5YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 to 6
Texture—clay loam, silty clay loam, silty clay, or clay
Calcium carbonate equivalent—0 to 5 percent
Visible secondary carbonates—0 to 2 percent fine or medium concretions
Electrical conductivity (EC)—dS/m of 0 to 2
Gypsum content—0 to 1 percent
Sodium adsorption ratio (SAR)—0 to 2
Effervescence—noneffervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Btk horizon:

Color—hue of 2.5YR or 5YR, value of 3 to 5 (2 to 4 moist), and chroma of 4 to 6
(5 or more in some part of the horizon)
Texture—clay loam, silty clay loam, silty clay, or clay



Figure 15.—Profile of Tillman clay loam. The left side of the scale is in centimeters times 10, and the right side is in feet.

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Calcium carbonate equivalent—5 to 30 percent
Visible secondary carbonates—1 to 25 percent fine to coarse concretions, films, threads, or masses
Electrical conductivity (EC)—dS/m of 0 to 8
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—0 to 12
Effervescence—strongly effervescent or violently effervescent
Reaction—moderately alkaline

B_{Ck} horizon:

Color—hue of 2.5YR or 5YR, value of 3 to 5 (2 to 4 moist), and chroma of 4 to 6
Texture—clay loam, silty clay loam, silty clay, or clay
Calcium carbonate equivalent—2 to 30 percent
Visible secondary carbonates—1 to 20 percent fine to coarse concretions, films, or masses
Electrical conductivity (EC)—dS/m of 0 to 8
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—0 to 12
Effervescence—slightly effervescent to violently effervescent
Reaction—slightly alkaline or moderately alkaline

C or 2C horizon:

Color—hue of 2.5YR, 5YR, or 5GY; value of 3 to 6 (2 to 5 moist); and chroma of 1 to 6
Texture—clay loam, silty clay loam, clay, or silty clay
Calcium carbonate equivalent—1 to 10 percent
Electrical conductivity (EC)—dS/m of 0 to 8
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—0 to 12
Effervescence—very slightly effervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

2C_d horizon (where present):

Color—shades of red, brown, gray, or green
Texture—clay loam, silty clay loam, clay, silty clay, or weakly consolidated claystone
Moist bulk density (g/cc)—1.70 to 2.25
Excavation difficulty—moderate or high
Calcium carbonate equivalent—1 to 8 percent
Electrical conductivity (EC)—dS/m of 1 to 8
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—0 to 8
Effervescence—very slightly effervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Tilvern Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Deep

Drainage class: Well drained

Parent material and geologic age: Clayey and claystone red-bed sediments of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Uplands

Landform: Hills

Position: Interfluvies and base slopes

Slope: 1 to 3 percent

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 58 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine, mixed, active, thermic Vertic Haplustepts

Associated Soils

These are soils of the Aspermont, Cottonwood, Jaywi, Knoco, Quanah, Talpa, Vernon, and Westill series. Aspermont soils are in landscape positions similar to those of the Tilvern soils and have a fine-silty particle-size control section. Cottonwood, Knoco, and Talpa soils are in the higher landscape positions and are less than 20 inches deep to bedrock. Jaywi and Quanah soils are on stream terraces or colluvial fans and have a fine-silty particle-size control section. Vernon soils are 20 to 40 inches deep to Permian-age red-bed sediments and are in the more sloping areas. Westill soils have a mollic epipedon and an argillic horizon and are in the higher landscape positions.

Typical Pedon

Tilvern clay loam (fig. 16), in an area of rangeland; King County, Texas; from the courthouse in Guthrie, Texas, 11.7 miles south on U.S. Highway 83, about 0.62 mile east on Croton Creek Ranch entrance road, 0.1 mile south on pipeline road, and 120 feet west in rangeland; latitude—33 degrees, 27 minutes, 5 seconds N.; longitude—100 degrees, 15 minutes, 42 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 5 inches; dark brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate fine and medium subangular blocky structure; very hard, firm; many fine and medium roots; few worm channels and wormcasts; slightly alkaline; clear wavy boundary. (2 to 8 inches thick)
- Bw—5 to 12 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate coarse angular blocky structure parting to moderate fine angular blocky; very hard, firm; common fine and medium roots; few worm channels and wormcasts; dark coatings on faces of coarse peds; few fine concretions of calcium carbonate; noncalcareous; moderately alkaline; gradual wavy boundary. (6 to 14 inches thick)
- Bk1—12 to 28 inches; reddish brown (5YR 5/4) silty clay, reddish brown (5YR 4/4) moist; moderate coarse angular blocky structure parting to moderate fine and medium angular blocky; very hard, firm; few fine and medium roots; few worm channels and wormcasts; common old cracks filled with loamy material; common large pressure faces; common fine and medium concretions of calcium carbonate; strong effervescence; moderately alkaline; diffuse wavy boundary. (13 to 22 inches thick)
- Bk2—28 to 46 inches; reddish brown (2.5YR 5/4) silty clay, reddish brown (2.5YR 4/4) moist; many wedge-shaped peds tilted at 15 to 35 degrees from the horizontal, parting to moderate fine and medium angular blocky structure; very hard, firm; few fine roots; common fine and medium concretions of calcium carbonate; strong effervescence; moderately alkaline; gradual wavy boundary. (12 to 18 inches thick)
- Bck—46 to 53 inches; reddish brown (2.5YR 5/4) silty clay, reddish brown (2.5YR 4/4) moist; moderate coarse subangular blocky structure parting to moderate fine



Figure 16.—Profile of Tilver clay loam. The subsoil has angular blocky structure.

and medium subangular blocky; very hard, firm; few fine roots; few medium distinct light olive gray (5Y 6/2) iron depletions; common pockets of gypsum crystals and masses of calcium carbonate; common fine and few medium concretions of calcium carbonate; few weathered claystone fragments in the lower part; strong effervescence; moderately alkaline; gradual wavy boundary. (0 to 8 inches thick)

Cd—53 to 80 inches; reddish brown (2.5YR 4/4), weakly consolidated claystone, dark reddish brown (2.5YR 3/4) moist; rocklike structure consisting of wedge-shaped aggregates that part to fine angular blocks; very hard, firm; common light greenish gray (5GY 7/1) strata and mottles; few thin red (2.5YR 5/6) loamy strata; few masses of calcium carbonate in the upper part; common masses of gypsum crystals; slight effervescence; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches

Depth to densic material: 40 to 60 inches

Vertic features: Cracks, $\frac{1}{4}$ to $\frac{3}{4}$ inch wide, extending to a depth more than 20 inches; wedge-shaped peds at a depth of 24 to 35 inches; and linear extensibility of 6.0 to 6.5 centimeters in the upper 40 inches of the soils

Particle-size control section (weighted average):

Clay content—40 to 55 percent

CEC/clay ratio—0.4 to 0.6

Soil Survey of Jackson County, Oklahoma

A horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (2 to 4 moist), and chroma of 2 to 4
Texture—clay loam
Calcium carbonate equivalent—0 to 5 percent
Electrical conductivity (EC)—dS/m of 0 to 2
Sodium adsorption ratio (SAR)—0 to 2
Effervescence—noneffervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Bw horizon:

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4
Texture—clay loam, clay, or silty clay
Calcium carbonate equivalent—2 to 10 percent
Visible secondary carbonates—1 to 10 percent very fine or fine concretions
Electrical conductivity (EC)—dS/m of 0 to 2
Sodium adsorption ratio (SAR)—0 to 2
Effervescence—noneffervescent to strongly effervescent
Reaction—moderately alkaline

Bk or Bkss horizon:

Color—hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6
Texture—clay or silty clay
Calcium carbonate equivalent—2 to 20 percent
Visible secondary carbonates—2 to 15 percent fine and medium concretions and masses
Electrical conductivity (EC)—dS/m of 0 to 12
Gypsum content—0 to 5 percent
Sodium adsorption ratio (SAR)—0 to 12
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

BCK horizon (where present):

Color—hue of 2.5YR or 5YR, value of 3 to 5 (2 to 4 moist), and chroma of 4 to 6
Texture—clay loam, clay, or silty clay
Content of rock fragments, by volume—0 to 10 percent weathered red-bed claystone fragments
Calcium carbonate equivalent—2 to 20 percent
Visible secondary carbonates—5 to 15 percent
Electrical conductivity (EC)—dS/m of 2 to 12
Gypsum content—1 to 5 percent
Sodium adsorption ratio (SAR)—2 to 12
Effervescence—strongly effervescent or violently effervescent
Reaction—moderately alkaline

Cd horizon:

Color—hue of 10R to 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6; gray, light gray, greenish gray, and olive gray mottles and strata are common.
Texture—red-bed claystone stratified with clay, silty clay, or clay; in some pedons, thin strata of gypsum or broken dolomitic limestone
Moist bulk density (g/cc)—1.70 to 2.25
Excavation difficulty—moderate or high
Calcium carbonate equivalent—1 to 8 percent
Visible secondary carbonates—0 to 5 percent in fractures
Electrical conductivity (EC)—dS/m of 1 to 8
Gypsum content—0 to 2 percent
Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Tipton Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, loamy and silty alluvium of late Pleistocene or Holocene age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Stream terraces

Position: Treads

Slope: Mainly less than 3 percent, but ranging from 0 to 8 percent

Mean annual precipitation: 22 to 32 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine-loamy, mixed, superactive, thermic Pachic Argiustolls

Associated Soils

These are soils of the Grandfield, Hardeman, Miles, and Roark series. Grandfield and Miles soils have an ochric epipedon and occur in convex areas. Hardeman soils have an ochric epipedon, a cambic horizon, and a coarse-loamy textural control section and occur in the slightly lower areas near drainageways. Roark soils are in landscape positions similar to those of the Tipton soils. They have a fine textured control section.

Typical Pedon

Tipton loam, in an area of cropland; Tillman County, Oklahoma; about 2½ miles south of Tipton; 1,650 feet south and 150 feet west of the northeast corner of sec. 24, T. 1 S., R. 19 W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 9 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; neutral; abrupt smooth boundary. (6 to 9 inches thick)

A—9 to 13 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable; neutral; clear smooth boundary. (4 to 8 inches thick)

BA—13 to 21 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable; many fine pores; many wormcasts; slightly alkaline; clear smooth boundary. (4 to 10 inches thick)

Bt1—21 to 34 inches; brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; hard, firm; many fine pores; many distinct clay films on faces of peds; moderately alkaline; gradual smooth boundary. (8 to 18 inches thick)

Bt2—34 to 40 inches; brown (7.5YR 5/3) clay loam, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; hard, firm; many fine pores; many

distinct clay films on faces of peds; moderately alkaline; gradual smooth boundary. (6 to 10 inches thick)

BC—40 to 66 inches; reddish yellow (7.5YR 6/6) loam, strong brown (7.5YR 5/6) moist; weak coarse prismatic structure; slightly hard, friable; few masses of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary. (20 to 30 inches thick)

Ck—66 to 72 inches; reddish yellow (5YR 6/6) loam, yellowish red (5YR 5/6) moist; massive; slightly hard, friable; many masses of calcium carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to more than 72 inches

Depth to secondary calcium carbonates: More than 20 inches

Thickness of the mollic epipedon: 20 to 40 inches

Particle-size control section (weighted average):

Clay content—20 to 35 percent

CEC/clay ratio—0.6 or more

Ap and A horizons:

Color—hue of 5YR to 10YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 or 3

Texture—loam or fine sandy loam

Effervescence—noneffervescent

Reaction—slightly acid to slightly alkaline

BA horizon:

Color—hue of 5YR to 10YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 or 3

Texture—loam, clay loam, or sandy clay loam

Effervescence—noneffervescent

Reaction—neutral or slightly alkaline

Bt or Btk horizon:

Color—hue of 5YR to 10YR, value of 2 to 6 (2 to 5 moist), and chroma of 2 to 6;
in some pedons, a few faint medium mottles of low chroma below a depth of
40 inches

Texture—loam, clay loam, or sandy clay loam

Clay content—20 to 35 percent

Calcium carbonate equivalent—0 to 15 percent

Effervescence—noneffervescent to strongly effervescent

Reaction—neutral to moderately alkaline

BC or BCK horizon:

Color—hue of 5YR or 7.5YR, value of 5 or 6 (4 or 5 moist), and chroma of 2 to 6;
in some pedons, a few faint medium mottles of low chroma below a depth of
40 inches

Texture—loam, clay loam, sandy clay loam, or sandy loam

Clay content—10 to 35 percent

Calcium carbonate equivalent—1 to 15 percent

Electrical conductivity (EC)—dS/m of 0 to 4

Effervescence—slightly effervescent to violently effervescent

Reaction—slightly alkaline or moderately alkaline

C or Ck horizon:

Color—hue of 5YR or 7.5YR, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 6;
in some pedons, a few faint medium mottles of low chroma below a depth of
40 inches

Texture—loam, clay loam, sandy clay loam, or sandy loam

Clay content—10 to 35 percent
Calcium carbonate equivalent—1 to 15 percent
Electrical conductivity (EC)—dS/m of 0 to 4
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

Treadway Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, saline, cypsiferous, clayey slope alluvium derived from claystone and shale of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Uplands

Landform: Pediments

Position: Toeslopes and alluvial fans

Slope: 0 to 3 percent

Mean annual precipitation: 22 to 30 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Fine, mixed, semiactive, thermic Gypsic Haplustepts

Associated Soils

These are soils of the Beckman, Clairemont, Hayfork, Knoco, Mangum, Nipsum, Spur, and Vernon series. Beckman, Hayfork, and Mangum soils are on the slightly lower flood plains. Clairemont and Spur soils are on the lower flood plains and have less than 35 percent clay in the particle-size control section. Knoco and Vernon soils are in the higher areas and have bedrock within 40 inches of the surface. Nipsum soils are in positions on the landscape similar to those of the Treadway soils and have a mollic epipedon.

Typical Pedon

Treadway silty clay loam, on a nearly level toeslope in an area of native range; Greer County, Oklahoma; from the intersection of U.S. Highway 283 and Oklahoma State Highway 34 in Mangum, about 16 miles north on U.S. Highway 283 and 11 miles west and 0.6 mile north on county roads; about 400 feet east in rangeland; about 2,100 feet south and 400 feet east of the northwest corner of sec. 1, T. 7 N., R. 24 W.; latitude—35 degrees, 06 minutes, 38.78 seconds N; longitude—99 degrees, 41 minutes, 34.84 seconds W.; Plainview, Oklahoma, topographic quadrangle; NAD 1927.

(Colors are for dry soil unless otherwise indicated.)

A1—0 to 2 inches; reddish brown (5YR 5/3) silty clay loam, reddish brown (5YR 4/3) moist; moderate medium platy structure; firm, hard; common fine and very fine and common medium roots; many fine and common medium pores; 1 percent shale fragments; very slight effervescence; moderately alkaline; abrupt smooth boundary.

A2—2 to 13 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate thick platy structure; very firm, extremely hard; common fine and

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very fine and common medium roots; many fine and common medium pores; 1 percent fine carbonate masses; 1 percent fine gypsum crystals, by volume; 1 percent gypsum, by weight; 1 percent fine crystals of other salts; very slightly saline; slightly sodic; 1 percent shale fragments; slight effervescence; moderately alkaline; gradual smooth boundary. (Combined thickness of the A horizons ranging from 5 to 15 inches)

Bk_{yz}1—13 to 24 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; weak medium prismatic structure parting to moderate fine subangular blocky; very firm, extremely hard; common fine and very fine and few medium roots; common fine and few medium pores; 1 percent fine carbonate masses; 10 percent fine gypsum crystals, by volume; 9 percent gypsum, by weight; 2 percent fine crystals of other salts; slightly saline; slightly sodic; 1 percent shale fragments; slight effervescence; moderately alkaline; gradual smooth boundary.

Bk_{yz}2—24 to 37 inches; reddish brown (5YR 5/3) silty clay, reddish brown (5YR 4/3) moist; weak coarse prismatic structure parting to weak medium angular blocky; very firm, extremely hard; common fine and very fine and few medium roots; few fine and very fine pores; 15 percent distinct pressure faces; 1 percent fine carbonate masses; 3 percent fine gypsum crystals, by volume; 2 percent gypsum, by weight; 5 percent fine crystals of other salts; moderately saline; strongly sodic; slight effervescence; moderately alkaline; clear smooth boundary.

Bk_{yz}3—37 to 43 inches; reddish brown (5YR 5/4) silty clay, reddish brown (5YR 4/4) moist; weak medium prismatic structure; few faint bedding planes; very firm, extremely hard; few fine and very fine roots; few fine and very fine pores; 1 percent fine carbonate masses; 1 percent fine gypsum crystals, by volume; 2 percent gypsum, by weight; 5 percent fine crystals of other salts; moderately saline; strongly sodic; strong effervescence; moderately alkaline; clear smooth boundary.

Bk_{yz}4—43 to 58 inches; reddish brown (5YR 5/3) silty clay, reddish brown (5YR 4/3) moist; weak medium prismatic structure; very firm, extremely hard; few fine and very fine roots; few fine and very fine pores; few fine iron-manganese masses; 1 percent fine carbonate masses; 1 percent fine gypsum crystals, by volume; 2 percent gypsum, by weight; 10 percent fine crystals of other salts; moderately saline; strongly sodic; slight effervescence; moderately alkaline; gradual smooth boundary.

Bk_{yz}5—58 to 70 inches; reddish brown (5YR 5/3) silty clay, reddish brown (5YR 4/3) moist; weak medium prismatic structure parting to moderate medium angular blocky; very firm, extremely hard; few fine and very fine roots; few fine and very fine pores; few fine iron-manganese masses; 1 percent fine carbonate masses; 1 percent fine gypsum crystals, by volume; 3 percent gypsum, by weight; 3 percent fine crystals of other salts; moderately saline; strongly sodic; slight effervescence; moderately alkaline; gradual wavy boundary. (Combined thickness of the Bk_{yz} horizons ranging from 20 to 70 inches)

Bk_{ssyz}—70 to 80 inches; reddish brown (5YR 5/3) silty clay, reddish brown (5YR 4/3) moist; weak coarse angular blocky structure parting to weak medium angular blocky; very firm, extremely hard; few fine and very fine roots; few fine and very fine pores; 5 percent distinct slickensides; few fine iron-manganese masses; 1 percent fine carbonate masses; 1 percent fine gypsum crystals, by volume; 2 percent gypsum, by weight; 2 percent fine crystals of other salts; moderately saline; strongly sodic; slight effervescence; moderately alkaline.

Range in Characteristics

Depth to secondary calcium carbonates: 0 to 20 inches

Depth to a gypsic horizon: 10 to 35 inches

Buried horizons: Occuring in some pedons (not diagnostic for the series)

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Particle-size control section (weighted average):

Clay content—35 to 60 percent

CEC/clay ratio—0.24 to 0.40

A horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4; thickness of less than 7 inches where moist value and chroma are 3

Texture—silty clay loam, clay loam, or clay

Clay content—30 to 60 percent

Content of rock fragments, by volume—0 to 5 percent shale, dolomite, and gypsum and possibly a few siliceous pebbles

Calcium carbonate equivalent—0 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 5 percent, by weight

Sodium adsorption ratio (SAR)—0 to 8

Effervescence—noneffervescent to strongly effervescent

Reaction—moderately alkaline or strongly alkaline

Bw horizon (where present):

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6

Texture—clay loam, silty clay loam, silty clay, or clay

Clay content—35 to 60 percent

Content of rock fragments, by volume—0 to 10 percent shale, dolomite, and gypsum and possibly a few siliceous pebbles

Calcium carbonate equivalent—0 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 4

Gypsum content—0 to 2 percent, by weight

Sodium adsorption ratio (SAR)—0 to 8

Effervescence—noneffervescent to strongly effervescent

Reaction—moderately alkaline or strongly alkaline

Bk_{yz} horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6

Texture—clay loam, silty clay loam, silty clay, or clay

Clay content—35 to 60 percent

Content of rock fragments, by volume—0 to 15 percent shale, dolomite, and gypsum and possibly a few siliceous pebbles

Calcium carbonate equivalent—2 to 15 percent

Electrical conductivity (EC)—dS/m of 2 to 16

Gypsum content—2 to 15 percent, by weight

Sodium adsorption ratio (SAR)—1 to 30

Effervescence—very slightly effervescent to violently effervescent

Reaction—moderately alkaline or strongly alkaline

BC horizon (where present):

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6

Texture—clay loam, silty clay loam, silty clay, or clay

Clay content—35 to 60 percent

Content of rock fragments, by volume—0 to 15 percent shale, dolomite, and gypsum and possibly a few siliceous pebbles

Calcium carbonate equivalent—2 to 15 percent

Electrical conductivity (EC)—dS/m of 2 to 16

Gypsum content—2 to 15 percent, by weight

Sodium adsorption ratio (SAR)—1 to 30

Effervescence—very slightly effervescent to violently effervescent

Reaction—moderately alkaline or strongly alkaline

C horizon (where present):

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6

Texture—clay loam silty clay loam, clay loam, silty clay, or clay; coarser textured material in weakly expressed to strongly expressed bedding planes and thin strata

Clay content—27 to 60 percent

Content of rock fragments, by volume—1 to 15 percent shale, dolomite, and gypsum and possibly a few siliceous pebbles

Calcium carbonate equivalent—2 to 15 percent

Electrical conductivity (EC)—dS/m of 4 to 16

Gypsum content—2 to 15 percent, by weight

Sodium adsorption ratio (SAR)—3 to 30

Effervescence—slightly effervescent to violently effervescent

Reaction—moderately alkaline or strongly alkaline

Vernon Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C); Rolling Limestone Prairie (78A)

Depth class: Moderately deep

Drainage class: Well drained

Parent material and geologic age: Residuum weathered from claystone of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Uplands

Landform: Hills

Position: Side slopes

Slope: 1 to 45 percent

Mean annual precipitation: 20 to 30 inches

Mean annual air temperature: 57 to 65 degrees F

Thornthwaite PE index: 32 to 46

Taxonomic classification: Fine, mixed, active, thermic Typic Haplustepts

Associated Soils

These are soils of the Aspermont, Burford, Hollister, Knoco, Obaro, Stamford, Tillman, Tilvern, Westill, and Weymouth series. Aspermont, Burford, Obaro, and Weymouth soils have a particle-size control section with less than 35 percent clay and are in landscape positions similar to those of the Vernon soils. Hollister and Stamford soils have smectitic mineralogy and are commonly on the lower, flatter slopes. In addition, Hollister soils have a mollic epipedon that is more than 20 inches thick and are more than 60 inches deep to claystone bedrock. Knoco soils are less than 20 inches deep to claystone bedrock and are on the slightly higher parts of the landscape. Tillman and Westill soils have a mollic epipedon and an argillic horizon and are on the flatter slopes. Tilvern soils are 40 to 60 inches deep to claystone bedrock and are in landscape positions similar to those of the Vernon soils.

Typical Pedon

Vernon clay, in an area of rangeland; Wilbarger County, Texas; from the intersection of U.S. Highways 183 and 283 and Texas Farm to Market Road 1763, which is about 12.5 miles south-southeast of Vernon, 3.22 miles south-southeast on U.S. Highways 183 and 283 (1.82 mile south-southeast of Beaver Creek), 1,430 feet southeast and east on an oil field road, and 75 feet south in rangeland; Texas Coordinate System Grid—829,850 feet N., 1,484,700 feet E.; USGS quadrangle—Grayback; latitude—33 degrees, 56 minutes, 10 seconds N.; longitude—99 degrees, 11 minutes, 56 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 5 inches; red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; moderate fine subangular blocky structure; very hard, firm, very sticky, plastic; many fine and common medium roots; few fine and medium concretions of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary. (3 to 12 inches thick)
- Bk—5 to 25 inches; dark red (2.5YR 3/6) clay, dark red (2.5YR 3/6) moist; moderate fine and medium subangular blocky structure; very hard, firm, very sticky, plastic; common fine and medium roots; common medium concretions of calcium carbonate; common pressure faces; violently effervescent; moderately alkaline; clear smooth boundary. (11 to 28 inches thick)
- Cd1—25 to 63 inches; red (2.5YR 4/6) claystone, red (2.5 4/6) moist; weak very thin platy and fine angular blocky rocklike structure; very hard, very firm, sticky, plastic; few fine roots along fractures; few masses of light greenish gray (5GY 7/1) claystone; strongly effervescent; moderately alkaline; gradual smooth boundary. (0 to 40 inches thick)
- Cd2—63 to 80 inches; red (2.5YR 4/6) claystone, red (2.5YR 4/6) moist; moderate coarse angular rocklike structure parting to fine angular blocks; extremely hard, extremely firm, very sticky, plastic; few masses of light greenish gray (5GY 7/1) claystone; slightly effervescent; moderately alkaline; gradual smooth boundary. (0 to 17 inches thick)

Range in Characteristics

Thickness of the solum: 20 to 40 inches

Depth to densic material: 20 to 40 inches

Particle-size control section (weighted average):

Clay content—40 to 60 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 6

Texture—clay loam, silty clay loam, silty clay, or clay

Calcium carbonate equivalent—0 to 15 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Sodium adsorption ratio (SAR)—0 to 2

Effervescence—noneffervescent to violently effervescent

Reaction—moderately alkaline

Bk or Bw horizon:

Color—hue of 10R to 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6

Texture—silty clay or clay

Clay content—40 to 60 percent

Calcium carbonate equivalent—5 to 20 percent

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Visible secondary carbonates—1 to 10 percent
Electrical conductivity (EC)—dS/m of 0 to 8
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—2 to 12
Effervescence—slightly effervescent to violently effervescent
Reaction—moderately alkaline

Cd1 horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 or 6
Texture—clay or weathered claystone
Moist bulk density (g/cc)—1.70 to 2.00
Excavation difficulty—low or moderate
Content of rock fragments, by volume—0 to 15 percent claystone paragravel fragments less than 3 inches in diameter
Calcium carbonate equivalent—1 to 8 percent
Visible secondary carbonates—0 to 5 percent, mainly along cleavage planes or fractures in the upper part
Electrical conductivity (EC)—dS/m of 1 to 8
Gypsum content—0 to 2 percent
Sodium adsorption ratio (SAR)—0 to 8
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

Cd2 horizon:

Color—hue of 2.5YR, 5YR, or 5GY; value of 4 to 6 (3 to 5 moist); and chroma of 1 to 6
Kind of rock—claystone with rock structure that is moderately to highly fractured and is mainly densic material that slakes in water; fractures that are 10 centimeters or more apart and can be penetrated by plant roots; a bulk density that is high enough to be root restrictive; thin, discontinuous strata of limestone or sandstone in some pedons
Moist bulk density (g/cc)—1.85 to 2.25
Excavation difficulty—moderate or high
Effervescence—noneffervescent to strongly effervescent
Reaction—moderately alkaline

Vinson Series

Major land resource area: Central Rolling Red Plains, Western Part (78B)

Depth class: Moderately deep

Drainage class: Well drained

Parent material and geologic age: Loamy residuum over gypsum bedrock of Permian age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Karstland

Landform: Hills

Position: Interfluves and side slopes

Slope: 0 to 5 percent

Mean annual precipitation: 22 to 32 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 48

Taxonomic classification: Fine-silty, mixed, superactive, thermic Entic Haplustolls

Associated Soils

These are soils of the Cornick, Cottonwood, Knoco, and Talpa series. Cornick and Cottonwood soils are less than 20 inches deep to gypsum bedrock. They are on the same landscape as the Vinson soils but generally are on steeper slopes. Knoco soils are less than 20 inches deep to claystone bedrock and are in the steeper adjacent areas. Talpa soils are less than 20 inches deep to limestone bedrock and are on the slightly higher adjacent ridge crests.

Typical Pedon

Vinson silt loam, on a slope of 3 percent in an area of rangeland; Beckham County, Oklahoma; 5 miles south and 3.2 miles east of Erick, Oklahoma, then 225 feet south in rangeland; 960 feet east and 225 feet south of the northwest corner of sec. 36, T. 8 N., R. 25 W.; latitude—35 degrees, 7 minutes, 51.2 seconds N.; longitude—99 degrees, 47 minutes, 49.6 seconds W.; USGS quadrangle—Erick, Oklahoma; NAD 83

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 10 inches; reddish brown (5YR 4/3) silt loam, dark reddish brown (5YR 3/3) moist; 23 percent clay; moderate fine granular structure; slightly hard, friable; many fine roots; common fine and few medium pores; common wormcasts; 2 percent fine carbonate nodules; 2 percent fragments of dolomite 2 to 20 millimeters in size; slightly effervescent; moderately alkaline; clear smooth boundary. (6 to 18 inches thick)
- Bk—10 to 28 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; 30 percent clay; weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable; common fine roots; common fine and common very fine pores; common wormcasts; 2 percent fine and medium carbonate nodules and 2 percent fine and medium carbonate masses; 2 percent fragments of dolomite 2 to 20 millimeters in size; strongly effervescent; moderately alkaline; clear smooth boundary. (10 to 25 inches thick)
- Bky—28 to 32 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; 30 percent clay; weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable; few fine roots; common fine and common very fine pores; common wormcasts; 2 percent fine and medium carbonate nodules and 2 percent fine and medium carbonate masses; 5 percent fine and medium gypsum masses; 2 percent fragments of dolomite 2 to 20 millimeters in size; strongly effervescent; moderately alkaline; abrupt wavy boundary. (10 to 22 inches thick)
- Cr—32 to 37 inches; weakly cemented gypsum bedrock; fractures in the gypsum occurring 5 to 6 inches apart; high excavation difficulty; common coatings of carbonate in rock fractures; clear wavy boundary. (0 to 10 inches thick)
- R—37 to 72 inches; strongly cemented gypsum bedrock; fractured at intervals of 39 to less than 78 inches; massive; extremely high excavation difficulty.

Range in Characteristics

Thickness of the solum: 20 to 40 inches

Depth to lithic contact: 20 to 40 inches

Particle-size control section (weighted average):

Clay content—18 to 32 percent

CEC/clay ratio—0.6 or more

A horizon:

Color—hue of 5YR or 7.5YR, value of 3 or 4 (2 or 3 moist), and chroma of 2 or 3

Texture—loam or silt loam

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Clay content—15 to 27 percent
Calcium carbonate equivalent—0 to 10 percent
Electrical conductivity (EC)—dS/m of 0 to 2
Gypsum content—0 to 1 percent
Effervescence—noneffervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

B horizon:

Color—hue of 5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6
Texture—loam, silt loam, clay loam, or silty clay loam
Clay content—18 to 32 percent
Calcium carbonate equivalent—5 to 15 percent
Electrical conductivity (EC)—dS/m of 0 to 2
Gypsum content—0 to 10 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

C horizon (where present):

Color—hue of 5YR to 10YR, value of 5 to 8 (4 to 7 moist), and chroma of 1 to 6
Texture—gypsiferous forms of loam, silt loam, silty clay loam, or clay loam
Calcium carbonate equivalent—5 to 15 percent
Electrical conductivity (EC)—dS/m of 0 to 4
Gypsum content—40 to 90 percent
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

Cr horizon (where present):

Color—hue of 7.5YR to 10YR, value of 6 to 8, and chroma of 1 to 6
Kind of rock—extremely weakly cemented to moderately cemented gypsum bedrock
Moist bulk density (g/cc)—1.85 to 2.00

R horizon:

Color—hue of 7.5YR to 10YR, value of 6 to 8, and chroma of 1 to 6
Kind of rock—strongly cemented or very strongly cemented crystalline gypsum or alabaster bedrock 5 to 15 feet thick; the gypsum interbedded with reddish brown claystone and thin layers of dolomite and greenish gray claystone; the upper boundary occurring as a root-restrictive lithic contact
Moist bulk density (g/cc)—1.85 to 2.35
Excavation difficulty—very high or extremely high

Westill Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, clayey alluvium over red-bed clays and claystone of Permian age (fig. 17)

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: Alluvial plains

Landform: Terraces



Figure 17.—Profile of Westill clay loam. Permian-age red-bed sediments are below a depth of about 56 inches.

Position: Treads

Slope: 0 to 3 percent

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 59 to 64 degrees F

Thornthwaite PE index: 32 to 40

Taxonomic classification: Fine, mixed, active, thermic Vertic Argiustolls

Associated Soils

These are soils of the Aspermont, Frankirk, Hollister, Kingco, Knoco, Tilvern, and Vernon series. Aspermont, Knoco, Tilvern, and Vernon soils have an ochric epipedon and do not have an argillic horizon. Aspermont, Knoco, and Vernon soils are in the lower areas on the steeper slopes, and Tilvern soils are in the same landscape positions as the Westill soils or in slightly higher positions. Frankirk soils formed in loamy alluvial sediments, do not have vertic properties, have secondary carbonates at a depth of more than 30 inches, and are in about the same landscape position as the Westill soils. Hollister soils have a mollic epipedon that is more than 20 inches thick and are in broad, nearly level areas on the slightly lower parts of the landscape. Kingco soils are in slight depressions and are Vertisols.

Typical Pedon

Westill clay loam, on a slope of 1 percent in an area of cropland; Harmon County, Oklahoma; from Hollis about 5 miles east on U.S. Highway 62, about 0.5 mile south on a county road, and 150 west in cropland; 2,150 feet north and 150 feet west of the southeast corner of sec. 4, T. 2 N., R. 25 W.; USGS quadrangle—Gould; latitude—34 degrees, 40 minutes, 25 seconds N.; longitude—99 degrees, 49 minutes, 29 seconds W.

(Colors are for dry soil unless otherwise indicated.)

- Ap—0 to 5 inches; reddish brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; moderate fine and medium subangular blocky structure parting to moderate fine and medium granular; hard, very friable; common very fine and fine roots; many very fine interstitial and tubular pores; very slightly effervescent; moderately alkaline; abrupt smooth boundary. (5 to 13 inches thick)
- Bt1—5 to 15 inches; dark reddish gray (5YR 4/2) clay, dark reddish brown (5YR 3/2) moist; moderate fine and medium angular blocky structure; the upper 4 inches occurring as a compacted and massive plowpan; very hard, friable; common very fine roots; common very fine interstitial and tubular pores; few distinct clay films on faces of peds; slightly effervescent; moderately alkaline; gradual smooth boundary.
- Bt2—15 to 24 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; weak medium prismatic structure parting to moderate fine and medium angular blocky; extremely hard, firm; few very fine roots; common very fine interstitial and tubular pores; common distinct clay films on faces of peds; few pressure faces; vertical cracks extending through the horizon are filled with darker material; few fine and medium calcium carbonate concretions; strongly effervescent; moderately alkaline; clear smooth boundary. (Combined thickness of the Bt horizons ranging from 10 to 30 inches)
- Btkss1—24 to 40 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; weak medium prismatic structure parting to moderate medium angular blocky and strong medium angular blocky; extremely hard, firm; few very fine roots; few very fine interstitial and tubular pores; common distinct clay films on faces of peds; common pressure faces; few distinct slickensides; vertical cracks extending through the horizon are filled with darker material; common fine and medium concretions and few fine and medium masses of calcium carbonate; common fine iron-manganese masses; violently effervescent; moderately alkaline; gradual wavy boundary.
- Btkss2—40 to 55 inches; reddish brown (5YR 5/3) silty clay, reddish brown (5YR 4/3) moist; about 3 percent light greenish gray (5GY 7/1) mottles; weak medium prismatic structure parting to moderate medium angular blocky and strong medium angular blocky; extremely hard, firm; few very fine roots; few very fine interstitial and tubular pores; common distinct clay films on faces of peds; common pressure faces; few distinct slickensides; vertical cracks extending through the horizon are filled with darker material; common fine and medium concretions and common fine and medium masses of calcium carbonate; violently effervescent; moderately alkaline; gradual wavy boundary. (Combined thickness of the Btkss horizons ranging from 10 to 45 inches)
- 2C—55 to 80 inches; reddish brown (5YR 4/4) silty clay, dark reddish brown (5YR 3/4) moist; about 10 percent light greenish gray (5GY 7/1) mottles; massive; very hard, firm; few distinct iron-manganese stains on the surface of rocklike fragments; few fine and medium masses of gypsum at the top of the horizon; strongly effervescent; 30 percent angular claystone paragravel; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches

Depth to secondary calcium carbonates: 0 to 24 inches

Depth to a calcic horizon (where present): More than 40 inches

Thickness of the mollic epipedon: 7 to 20 inches

Vertic features: Cracks 5 millimeters or more wide extending to a depth of 30 centimeters or more; a few small slickensides at 10- to 15-degree angles from the horizontal or small wedge-shaped peds

Particle-size control section (weighted average):

Clay content—35 to 50 percent

CEC/clay ratio—0.4 to 0.6

A horizon:

Color—hue of 5YR or 7.5YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 or 3

Texture—silt loam, silty clay loam, or clay loam

Clay content—20 to 35 percent

Content of rock fragments, by volume—0 to 10 percent siliceous pebbles

Electrical conductivity (EC)—dS/m of 0 to 2

Sodium adsorption ratio (SAR)—0 to 1

Effervescence—noneffervescent to slightly effervescent

Reaction—neutral to moderately alkaline

Bt horizon:

Color—hue of 2.5YR to 7.5YR, value of 3 to 5 (2 to 4 moist), and chroma of 2 to 6

Texture—clay, silty clay, silty clay loam, or clay loam

Content of rock fragments, by volume—0 to 10 percent siliceous pebbles

Calcium carbonate equivalent—0 to 10 percent

Electrical conductivity (EC)—dS/m of 0 to 2

Sodium adsorption ratio (SAR)—0 to 2

Effervescence—noneffervescent to strongly effervescent

Reaction—slightly alkaline or moderately alkaline

Btkss horizon:

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6

Texture—clay, silty clay, silty clay loam, or clay loam

Content of rock fragments, by volume—0 to 10 percent siliceous pebbles

Calcium carbonate equivalent—2 to 15 percent

Visible secondary carbonates—few or common concretions and soft masses

Electrical conductivity (EC)—dS/m of 0 to 4

Gypsum content—0 to 2 percent

Sodium adsorption ratio (SAR)—0 to 6

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline

BC horizon (where present):

Color—hue of 2.5YR or 5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 or 6

Texture—clay, silty clay, silty clay loam, or clay loam

Content of rock fragments, by volume—0 to 10 percent paragravel fragments of claystone or siltstone

Calcium carbonate equivalent—2 to 15 percent

Visible secondary carbonates—few or common concretions or soft masses

Electrical conductivity (EC)—dS/m of 0 to 8

Gypsum content—0 to 3 percent

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Sodium adsorption ratio (SAR)—0 to 6
Effervescence—slightly effervescent or strongly effervescent
Reaction—moderately alkaline

2C or 2Cd horizon (where present):

Color—hue of either 2.5YR to 7.5YR or 5GY; value of 4 to 7 (3 to 6 moist); and chroma of 1 to 6
Texture—clay loam, silty clay, clay, or interbedded layers of weakly cemented claystone or siltstone
Calcium carbonate equivalent—1 to 10 percent
Electrical conductivity (EC)—dS/m of 1 to 8
Gypsum content—0 to 3 percent
Sodium adsorption ratio (SAR)—0 to 8
Effervescence—noneffervescent to strongly effervescent
Reaction—slightly alkaline or moderately alkaline

Westola Series

Major land resource areas: Central Rolling Red Plains, Western Part (78B); Central Rolling Red Plains, Eastern Part (78C)

Depth class: Very deep

Drainage class: Well drained

Flooding: Frequently flooded to rarely flooded for very brief periods during the months of April through October

Parent material and geologic age: Calcareous, loamy alluvium of Recent age

Physiographic region: Interior Plains

Physiographic province: Central Lowland

Physiographic sub-province: Osage Plains

Landscape: River valleys

Landform: Flood plains

Slope: 0 to 1 percent

Mean annual precipitation: 22 to 32 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 32 to 44

Taxonomic classification: Coarse-loamy, mixed, superactive, calcareous, thermic Typic Ustifluvents

Associated Soils

These are soils of the Clairemont, Gracemont, Gracemore, Lincoln, and Wheatwood series. Clairemont and Wheatwood soils are in landscape positions similar to those of the Westola soils. They have a fine-silty particle-size textural control section. Gracemont and Gracemore soils are in the lower areas and have a water table within 6 feet of the surface. Lincoln soils are in landscape positions similar to those of the Westola soils. They have a sandy particle-size textural control section.

Typical Pedon

Westola fine sandy loam, in a cultivated area; Woods County, Oklahoma; about 2 miles east and 1 mile south of Freedom, Oklahoma; about 450 feet north and 2,100 feet east of the southwest corner of sec. 6, T. 26 N., R. 17 W.

(Colors are for dry soil unless otherwise indicated.)

Ap—0 to 7 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR

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4/4) moist; weak fine granular structure; soft, very friable; few fine roots; strongly effervescent; moderately alkaline; abrupt smooth boundary. (0 to 8 inches thick)

A—7 to 11 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; weak fine subangular blocky structure parting to weak fine granular; soft, very friable; few fine roots; strongly effervescent; moderately alkaline; clear smooth boundary. (8 to 12 inches thick)

C1—11 to 40 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; massive; soft, very friable; few fine roots; common distinct strata of loamy fine sand and fine sand 3 to 13 millimeters thick and common distinct strata of dark reddish brown (5YR 3/3) loam and fine sandy loam 1 to 2 millimeters thick; strongly effervescent; moderately alkaline; clear smooth boundary. (0 to 48 inches thick)

C2—40 to 80 inches; reddish brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; massive; soft, very friable; common distinct strata of yellowish red (5YR 4/6) fine sandy loam and dark reddish brown (5YR 3/4) silt loam 1 to 2 millimeters thick; strongly effervescent; moderately alkaline.

Range in Characteristics

Particle-size control section (weighted average):

Clay content—5 to 18 percent

CEC/clay ratio—0.6 or more

Ap and A horizons:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6; an organic matter content of less than 1 percent where moist value is 3 or less, chroma is 3 or less, and horizon thickness is more than 10 inches

Texture—fine sandy loam, loam, very fine sandy loam, or loamy fine sand

Calcium carbonate equivalent—1 to 5 percent

Effervescence—slightly effervescent or strongly effervescent

Reaction—slightly to moderately alkaline

C horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 7 (3 to 6 moist), and chroma of 3 to 8; dry value of 7 or 8 in strata of clean sand

Texture—dominantly fine sandy loam, loam, or very fine sandy loam; in some pedons texture may be loamy fine sand or coarser below a depth 40 inches; strata that are as much as 10 centimeters thick and have texture ranging from sand to clay loam are common.

Calcium carbonate equivalent—1 to 10 percent

Effervescence—slightly effervescent or strongly effervescent

Reaction—moderately alkaline

Some pedons have an AC horizon, which has color, texture, and reaction similar to those of the A horizon. These pedons occur in rarely flooded areas, which are stable for longer periods than the more frequently flooded areas.

Some pedons have buried horizons below a depth of 40 inches.

Woods Series

Major land resource area: Southern High Plains, Breaks (77E)

Depth class: Very deep

Drainage class: Well drained

Parent material and geologic age: Calcareous, clayey alluvial sediments of Tertiary age

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Physiographic region: Interior Plains

Physiographic province: Great Plains

Physiographic sub-province: Plains Border

Landscape: Alluvial plains

Landform: Knolls

Position: Interfluves and side slopes

Slope: 0 to 15 percent

Mean annual precipitation: 20 to 24 inches

Mean annual air temperature: 57 to 64 degrees F

Thornthwaite PE index: 30 to 38

Taxonomic classification: Fine, smectitic, thermic Typic Calciusterts

Associated Soils

These are soils of the Abbie, Case, Farry, Fortyone, Irene, Mansic, and Oklark series. Abbie and Irene soils are on broad, smooth ridgetops and have less than 35 percent clay in the textural control. Case soils have a fine-loamy textural control section and occur on the higher side slopes. Farry and Fortyone soils are typically on back slopes, shoulder slopes, and summits at the higher elevations and occur in areas of sandy and gravelly sediments. Farry soils have a fine-loamy textural control section, and Fortyone soils have a coarse-loamy textural control section. Mansic and Oklark soils are on the slightly higher side slopes. Mansic soils have a fine-loamy textural control section, and Oklark soils have a coarse-loamy textural control section.

Typical Pedon

Woods silty clay loam, on a slope of 5 percent in an area of rangeland; Woods County, Oklahoma; about 11 miles north and 2 miles west of Freedom, Oklahoma; 1,550 feet west and 2,600 feet south of the northeast corner of sec. 4, T. 28 N., R. 18 W.

(Colors are for dry soil unless otherwise indicated.)

- A—0 to 10 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure parting to moderate fine granular; very hard, firm; many fine roots; few fine concretions of calcium carbonate; slightly effervescent; moderately alkaline; clear smooth boundary. (9 to 13 inches thick)
- Btss—10 to 26 inches; brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong medium angular blocky; extremely hard, very firm; few fine and common very fine roots; few fine threads and concretions of calcium carbonate; common distinct pressure faces and slickensides at angles of about 45 degrees; cracks filled with very dark grayish brown (10YR 3/2) silty clay loam; prominent clay films on faces of peds; strongly effervescent; moderately alkaline; clear smooth boundary. (9 to 26 inches thick)
- Bk—26 to 30 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; weak coarse prismatic structure parting to weak medium subangular blocky; very hard, very firm; few fine and very fine roots; common medium soft masses and coatings of calcium carbonate, which make up about 25 percent of the volume; violently effervescent; moderately alkaline; clear smooth boundary. (0 to 18 inches thick)
- Ck—30 to 80 inches; pink (7.5YR 7/4) strata of silt loam, clay loam, and silty clay, light brown (7.5YR 6/4) moist; massive; hard, firm; common fine and few medium soft masses and coatings of calcium carbonate, which make up about 10 percent of the volume; a 2-inch stratum that has many fine gypsum crystals and is noncalcareous; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 9 to 13 inches

Depth to secondary calcium carbonates: 0 to 10 inches

Depth to a calcic horizon: 10 to 30 inches

Vertic features: When the soils are dry, cracks as much as 1 inch wide extending from the surface to a depth of 20 inches or more; the cracks are 1 centimeter or more wide at a depth of 20 inches.

Clay content in the particle-size control section (weighted average): 35 to 60 percent

A horizon:

Color—hue of 10YR, value of 4 (3 moist), and chroma of 1 or 2

Texture—silty clay loam or clay loam

Clay content—27 to 40 percent

Calcium carbonate equivalent—0 to 5 percent

Effervescence—noneffervescent to strongly effervescent

Reaction—moderately alkaline

Btss horizon:

Color—hue of 7.5YR or 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 3 to 6

Texture—silty clay or silty clay loam

Clay content—35 to 60 percent

Calcium carbonate equivalent—5 to 15 percent

Visible secondary carbonates—0 to 2 percent

Effervescence—strongly effervescent or violently effervescent

Reaction—moderately alkaline

Other features—pressure faces and slickensides at 45- to 60-degree angles; cracks filled with darker material from above

Bk horizon:

Color—hue of 7.5YR or 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 to 6

Texture—silty clay, silty clay loam, or clay loam

Clay content—27 to 60 percent

Calcium carbonate equivalent—15 to 40 percent

Visible secondary carbonates—5 to 30 percent

Effervescence—violently effervescent

Reaction—moderately alkaline

Other features—slickensides or pressure faces in some pedons

Ck horizon:

Color—hue of 7.5YR to 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 4 to 6

Texture—stratified clay, silty clay, silty clay loam, silt loam, or clay loam

Clay content—18 to 60 percent

Calcium carbonate equivalent—5 to 20 percent

Visible secondary carbonates—1 to 10 percent

Effervescence—strongly effervescent or violently effervescent

Reaction—moderately alkaline

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the headings the “Use and Management of the Soils” and “Soil Properties.”

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the characteristics of the major components in the map units.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

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Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Acme loam, 0 to 1 percent slopes, is a phase of the Acme series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Talpa-Aspermont-Rock outcrop complex, 1 to 8 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Grandmore and Grandfield loamy sands, 0 to 3 percent slopes, is an undifferentiated group in this survey area.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

The table "Acreage and Proportionate Extent of Soils" gives the extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
Acma	Acme loam, 0 to 1 percent slopes-----	946	0.2
ArHF	Arnett-Hardeman complex, 3 to 15 percent slopes-----	2,251	0.4
ArnB	Arnett sandy loam, 1 to 3 percent slopes-----	1,557	0.3
ArnC	Arnett sandy loam, 3 to 5 percent slopes-----	3,863	0.7
AsmB	Aspermont silt loam, 1 to 3 percent slopes-----	16,770	3.2
AsmC	Aspermont silt loam, 3 to 5 percent slopes-----	5,773	1.1
BekA	Beckman silty clay, 0 to 1 percent slopes, occasionally flooded-----	65	*
BfdB	Burford loam, 1 to 3 percent slopes-----	2,263	0.4
BfdC	Burford loam, 3 to 5 percent slopes-----	846	0.2
CobB	Cobb fine sandy loam, 1 to 3 percent slopes-----	3,041	0.6
CVRD	Cottonwood-Vinson-Rock outcrop complex, 1 to 8 percent slopes-----	4,522	0.9
DAM	Dams-----	17	*
DcbB	Decobb very fine sandy loam, 1 to 3 percent slopes-----	4,449	0.9
DeSD	Devol and Springer loamy sands, 3 to 8 percent slopes-----	1,888	0.4
EatA	Eastall silty clay, 0 to 1 percent slopes-----	342	*
EdsB	Eda sand, 0 to 3 percent slopes-----	3,038	0.6
EdsD	Eda sand, 3 to 8 percent slopes-----	6,269	1.2
EdsF	Eda sand, 8 to 15 percent slopes-----	1,497	0.3
FayB	Farry fine sandy loam, 1 to 3 percent slopes-----	4,906	0.9
FraB	Frankirk loam, 1 to 3 percent slopes-----	2,147	0.4
GdfB	Grandfield fine sandy loam, 1 to 3 percent slopes-----	3,094	0.6
GfGB	Grandmore and Grandfield fine sandy loams, 1 to 3 percent slopes-----	4,614	0.9
GLGB	Grandmore and Grandfield loamy sands, 0 to 3 percent slopes-----	11,962	2.3
GlsB	Grandfield loamy sand, 0 to 3 percent slopes-----	6,535	1.2
GlsD	Grandfield loamy sand, 3 to 8 percent slopes-----	1,546	0.3
GmuA	Gracemont fine sandy loam, saline, 0 to 1 percent slopes, occasionally flooded-----	5,006	1.0

See footnote at end of table.

Soil Survey of Jackson County, Oklahoma

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
GmwA	Gracemont fine sandy loam, saline, 0 to 1 percent slopes, frequently flooded-----	5,282	1.0
GsEA	Gracemore and Ezell soils, saline, 0 to 1 percent slopes, frequently flooded-----	13,082	2.5
HdmA	Hardeman fine sandy loam, 0 to 1 percent slopes-----	4,356	0.8
HdmB	Hardeman fine sandy loam, 1 to 3 percent slopes-----	7,904	1.5
HdmC	Hardeman fine sandy loam, 3 to 5 percent slopes-----	2,599	0.5
HdmE	Hardeman fine sandy loam, 5 to 12 percent slopes-----	1,929	0.4
HeyB	Heatly sand, 0 to 3 percent slopes-----	2,570	0.5
HkfA	Headrick fine sandy loam, 0 to 1 percent slopes-----	2,055	0.4
HksA	Headrick loamy sand, 0 to 1 percent slopes-----	7,293	1.4
HolA	Hollister silty clay loam, 0 to 1 percent slopes-----	73,964	14.1
HrAC	Harmon-Aspermont complex, 1 to 5 percent slopes-----	3,916	0.7
JesC	Jester fine sand, 1 to 5 percent slopes-----	4,035	0.8
JesF	Jester fine sand, 5 to 20 percent slopes-----	6,538	1.2
KcRG	Knoco soils and Rock outcrop, 12 to 40 percent slopes-----	5,599	1.1
KoBE	Knoco-Badland complex, 1 to 12 percent slopes-----	3,512	0.7
LacB	La Casa silty clay loam, 1 to 3 percent slopes-----	26,445	5.1
LDF	Landfill-----	79	*
LnuA	Lincoln loamy sand, 0 to 1 percent slopes, occasionally flooded-----	4,880	0.9
LnWA	Lincoln and Westola soils, 0 to 1 percent slopes, frequently flooded-----	8,049	1.5
M-W	Miscellaneous water-----	242	*
MagA	Madge loam, 0 to 1 percent slopes-----	5,144	1.0
MagB	Madge loam, 1 to 3 percent slopes-----	5,245	1.0
MngA	Mangum silty clay loam, 0 to 1 percent slopes, occasionally flooded-----	439	*
NipA	Nipsum silty clay loam, 0 to 1 percent slopes-----	6,557	1.3
NOTCOM	Area not surveyed, access denied-----	4,103	0.8
OakA	Oakley loam, 0 to 1 percent slopes-----	2,532	0.5
OakB	Oakley loam, 1 to 3 percent slopes-----	1,673	0.3
OzKA	Ozark fine sandy loam, 0 to 1 percent slopes-----	6,665	1.3
OzSA	Ozark fine sandy loam, saline, 0 to 1 percent slopes-----	1,107	0.2
PIT	Pits-----	831	0.2
RakA	Roark loam, 0 to 1 percent slopes-----	23,531	4.5
RKBG	Rock outcrop-Brico complex, 8 to 50 percent slopes-----	771	0.1
RKO	Rock outcrop, granite-----	463	*
RuuA	Rups silty clay loam, 0 to 1 percent slopes, occasionally flooded-----	1,950	0.4
RuwA	Rups silty clay loam, 0 to 1 percent slopes, frequently flooded-----	6,833	1.3
SkCC2	Spikebox-Cobb complex, 3 to 5 percent slopes, eroded-----	1,969	0.4
SpDB	Springer and Devol loamy sands, 0 to 3 percent slopes-----	5,585	1.1
SurA	Spur clay loam, 0 to 1 percent slopes, rarely flooded-----	8,466	1.6
SuuA	Spur clay loam, 0 to 1 percent slopes, occasionally flooded-----	19,394	3.7
SuwA	Spur clay loam, 0 to 1 percent slopes, frequently flooded-----	6,126	1.2
TARD	Talpa-Aspermont-Rock outcrop complex, 1 to 8 percent slopes-----	4,680	0.9
TilA	Tillman clay loam, 0 to 1 percent slopes-----	9,253	1.8
TilB	Tillman clay loam, 1 to 3 percent slopes-----	22,018	4.2
TipA	Tipton loam, 0 to 1 percent slopes-----	17,382	3.3
TlvB	Tilvern clay loam, 1 to 3 percent slopes-----	12,966	2.5
TpFA	Tipton fine sandy loam, 0 to 1 percent slopes-----	6,352	1.2
TrwB	Treadway silty clay loam, 0 to 2 percent slopes-----	1,286	0.2
UST	Ustorthents, 5 to 40 percent slopes, very stony-----	1,195	0.2
VeKE	Vernon-Knoco complex, 1 to 12 percent slopes-----	4,630	0.9
VerC	Vernon clay loam, 3 to 5 percent slopes-----	4,843	0.9
VeTE	Vernon-Talpa complex, 1 to 12 percent slopes, stony-----	11,275	2.2
W	Water-----	10,707	2.0
WodB	Woods clay loam, 1 to 3 percent slopes-----	849	0.2
WslA	Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded-----	6,588	1.3
WstA	Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded-----	2,452	0.5
WtlA	Westill clay loam, 0 to 1 percent slopes-----	3,111	0.6
WtlB	Westill clay loam, 1 to 3 percent slopes-----	10,642	2.0
	Total-----	523,149	100.0

* Less than 0.1 percent.

AcmA—Acme loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: West of Eldorado, near the Corinth Church

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Note: A fluctuating water table affects this map unit in years of average or above average precipitation.

Characteristics of Acme and Similar Soils

Composition: 79 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 8.1 inches

Depth to the top of the seasonal high water table: 4.0 to 6.0 feet

Flooding: None

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 3s

Ecological site ID and name: R078BY079TX, Loamy PE 25-36

Typical profile:

Ap—0 to 15 inches; loam

By1—15 to 20 inches; clay loam

By2—20 to 40 inches; loam

Cy—40 to 80 inches; gypsiferous loam

Location of typical profile: 1,350 feet north and 100 feet west of the southeast corner of sec. 36, T. 1 N., R. 25 W. (Harmon Co., OK); latitude—34 degrees, 30 minutes, 39 seconds N.; longitude—99 degrees, 46 minutes, 17 seconds W.; USGS quadrangle—Hollis SE

Additional Components

Cottonwood and similar soils: 13 percent

Tipton and similar soils: 5 percent

Roark and similar soils: 3 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

ArHF—Arnett-Hardeman complex, 3 to 15 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Note: Areas of this map unit have been mined for gravel used as roadbed material.

Characteristics of Arnett and Similar Soils

Composition: 45 percent

Geomorphic setting: Stream terraces in river valleys

Position on landform: Risers

Parent material: Loamy alluvium over gravelly alluvium

Slope: 3 to 8 percent

Runoff class: Medium

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 8.9 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 15 inches; sandy loam

Bt—15 to 40 inches; sandy clay loam

2Bt—40 to 58 inches; gravelly sandy clay loam

2BC—58 to 80 inches; gravelly sandy loam

Location of typical profile: 100 feet north and 170 feet east of the southwest corner of sec. 20, T. 4 N., R. 19 W.; latitude—34 degrees, 47 minutes, 53 seconds N.; longitude—99 degrees, 12 minutes, 45 seconds W.; USGS quadrangle—Warren

Characteristics of Hardeman and Similar Soils

Composition: 40 percent

Geomorphic setting: Stream terraces in river valleys

Position on landform: Risers

Parent material: Coarse-loamy alluvium and/or eolian deposits

Slope: 3 to 15 percent

Soil Survey of Jackson County, Oklahoma

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Well drained

Available water capacity: About 7.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 7 inches; fine sandy loam

Bw—7 to 40 inches; fine sandy loam

Bk—40 to 60 inches; loam

BCK—60 to 80 inches; fine sandy loam

Location of typical profile: 2,520 feet north and 2,600 feet west of the southeast corner of sec. 31, T. 3 N., R. 18 W.; latitude—34 degrees, 41 minutes, 19 seconds N.; longitude—99 degrees, 7 minutes, 53 seconds W.; USGS quadrangle—Headrick

Additional Components

Ustipsamments: 10 percent

Westola and similar soils: 5 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

ArnB—Arnett sandy loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Note: Areas of this map unit have been mined for gravel used as roadbed material.

Characteristics of Arnett and Similar Soils

Composition: 85 percent

Geomorphic setting: Terraces on alluvial plains

Soil Survey of Jackson County, Oklahoma

Position on landform: Knolls

Parent material: Loamy alluvium over gravelly alluvium

Slope: 1 to 3 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 8.3 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

Ap—0 to 7 inches; sandy loam

Btk—7 to 26 inches; sandy clay loam

BCK—26 to 46 inches; sandy clay loam

Ck—46 to 80 inches; sandy loam

Location of typical profile: 1,450 feet south and 2,300 feet east of the northwest corner of sec. 26, T. 1 S., R. 24 W.; latitude—34 degrees, 26 minutes, 50 seconds N.; longitude—99 degrees, 40 minutes, 58 seconds W.; USGS quadrangle—Eldorado

Additional Components

Farry and similar soils: 10 percent

McKnight and similar soils: 5 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

ArnC—Arnett sandy loam, 3 to 5 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Note: Areas of this map unit have been mined for gravel used as roadbed material.

Characteristics of Arnett and Similar Soils

Composition: 80 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Knolls

Parent material: Loamy alluvium over gravelly alluvium

Slope: 3 to 5 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 8.3 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

Ap—0 to 7 inches; sandy loam

Bt—7 to 17 inches; clay loam

2Bt—17 to 31 inches; gravelly sandy clay loam

2BC—31 to 44 inches; gravelly sandy loam

2C—44 to 80 inches; very gravelly sandy loam stratified with sandy clay loam
and clay loam

Location of typical profile: 850 feet south and 250 feet west of the northeast corner of
sec. 22, T. 1 S., R. 24 W.; latitude—34 degrees, 27 minutes, 44 seconds N.;
longitude—99 degrees, 41 minutes, 30 seconds W.; USGS quadrangle—
Eldorado

Additional Components

McKnight and similar soils: 10 percent

Farry and similar soils: 7 percent

Fortyone and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this
publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

AsmB—Aspermont silt loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 20 to 26 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days
Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Aspermont and Similar Soils

Composition: 76 percent
Geomorphic setting: Hills on karstland
Position on landform: Interfluves and base slopes
Parent material: Fine-silty colluvium over silty and clayey residuum weathered from shale and siltstone
Slope: 1 to 3 percent
Runoff class: Medium
Depth to densic bedrock: 40 to 60 inches
Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer: Moderately slow
Slowest permeability class within a depth of 80 inches: Impermeable
Drainage class: Well drained
Available water capacity: About 9.3 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Flooding: None
Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e
Ecological site ID and name: R078BY079TX, Loamy PE 25-36

Typical profile:

Ap—0 to 6 inches; silt loam
Bk1—6 to 34 inches; silty clay loam
Bk2—34 to 43 inches; silty clay loam
2BCK—43 to 50 inches; silty clay loam
2Cd—50 to 80 inches; silty clay

Location of typical profile: 950 feet north and 1,550 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.; latitude—34 degrees, 37 minutes, 33 seconds N.; longitude—99 degrees, 36 minutes, 33 seconds W.; USGS quadrangle—Duke

Additional Components

La Casa and similar soils: 13 percent
Nipsum and similar soils: 5 percent
Cottonwood and similar soils: 3 percent
Harmon and similar soils: 3 percent

Management

Major uses: Cropland and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

AsmC—Aspermont silt loam, 3 to 5 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 5 to 100 acres

Characteristics of Aspermont and Similar Soils

Composition: 81 percent

Geomorphic setting: Hills on karstland

Position on landform: Side slopes

Parent material: Fine-silty colluvium over silty and clayey residuum weathered from shale and siltstone

Slope: 3 to 5 percent

Runoff class: Medium

Depth to densic bedrock: 40 to 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 9.3 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078BY079TX, Loamy PE 25-36

Typical profile:

Ap—0 to 8 inches; silt loam

Bk1—8 to 35 inches; silty clay loam

Bk2—35 to 50 inches; silty clay loam

2Cd—50 to 80 inches; silty clay

Location of typical profile: 1,700 feet south and 450 feet east of the northwest corner of sec. 14, T. 1 S., R. 23 W.; latitude—34 degrees, 28 minutes, 27 seconds N.; longitude—99 degrees, 35 minutes, 5 seconds W.; USGS quadrangle—Quanah NE

Additional Components

La Casa and similar soils: 13 percent

Cottonwood and similar soils: 3 percent

Harmon and similar soils: 3 percent

Management

Major uses: Pasture and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

BekA—Beckman silty clay, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,300 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Long and narrow, 10 to 100 acres

Characteristics of Beckman and Similar Soils

Composition: 81 percent

Geomorphic setting: Flood plains

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Runoff class: High

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Moderately well drained

Available water capacity: About 6.5 inches

Depth to the top of the seasonal high water table: 3.0 to 5.9 feet

Flooding: Occasional

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 4s

Ecological site ID and name: R078XY046OK, Saline Bottomland

Typical profile:

A—0 to 11 inches; silty clay

Ckz—11 to 44 inches; clay

Cyz—44 to 80 inches; silty clay

Location of typical profile: 1,000 feet south and 2,300 feet west of the northeast corner of sec. 35, T. 3 N., R. 24 W. (Harmon Co., OK); latitude—34 degrees, 41 minutes, 34 seconds N.; longitude—99 degrees, 41 minutes, 29 seconds W.; USGS quadrangle—McQueen

Additional Components

Retrop and similar soils: 15 percent

Mangum and similar soils: 2 percent

Spur and similar soils: 2 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

BfdB—Burford loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Burford and Similar Soils

Composition: 90 percent

Geomorphic setting: Hills on uplands

Position on landform: Interfluves

Parent material: Silty alluvium over silty and clayey residuum weathered from shale and siltstone

Slope: 1 to 3 percent

Runoff class: Medium

Depth to densic bedrock: 40 to 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 7.9 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY057OK, Limy Prairie

Typical profile:

Ap—0 to 5 inches; loam

Bw—5 to 12 inches; silty clay loam

Bk—12 to 30 inches; clay loam

2BCK—30 to 43 inches; silty clay loam

2Cd—43 to 80 inches; silty clay

Location of typical profile: 2,350 feet south and 1,400 feet east of the northwest corner of sec. 19, T. 3 N., R. 20 W.; latitude—34 degrees, 43 minutes, 8 seconds N.; longitude—99 degrees, 20 minutes, 50 seconds W.; USGS quadrangle—Altus

Additional Components

Tillman and similar soils: 5 percent

Vernon and similar soils: 5 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

BfdC—Burford loam, 3 to 5 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 5 to 100 acres

Characteristics of Burford and Similar Soils

Composition: 92 percent

Geomorphic setting: Hills on uplands

Position on landform: Side slopes

Parent material: Silty alluvium over silty and clayey residuum weathered from shale and siltstone

Slope: 3 to 5 percent

Runoff class: Medium

Depth to densic bedrock: 40 to 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 7.4 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078CY057OK, Limy Prairie

Typical profile:

Ap—0 to 6 inches; loam

Bk—6 to 24 inches; clay loam

2Bk—24 to 40 inches; silty clay loam

2Cd—40 to 80 inches; silty clay

Location of typical profile: 500 feet south and 50 feet west of the northeast corner of sec. 36, T. 1 N., R. 20 W.; latitude—34 degrees, 31 minutes, 12 seconds N.; longitude—99 degrees, 14 minutes, 45 seconds W.; USGS quadrangle—Tipton

Additional Components

Vernon and similar soils: 5 percent

Spikebox and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

CobB—Cobb fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Cobb and Similar Soils

Composition: 75 percent

Geomorphic setting: Hills on uplands

Position on landform: Interfluves and side slopes

Parent material: Loamy residuum weathered from sandstone

Slope: 1 to 3 percent

Runoff class: Low

Depth to paralithic bedrock: 20 to 40 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Well drained

Available water capacity: About 5.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

Ap—0 to 7 inches; fine sandy loam

Bt—7 to 29 inches; sandy clay loam

BC—29 to 34 inches; fine sandy loam

Cr—34 to 80 inches; bedrock

Location of typical profile: 400 feet north and 1,900 feet east of the southwest corner of sec. 17, T. 3 N., R. 20 W.; latitude—34 degrees, 43 minutes, 34 seconds N.; longitude—99 degrees, 19 minutes, 42 seconds W.; USGS quadrangle—Altus

Additional Components

Decobb and similar soils: 10 percent
Spikebox and similar soils: 10 percent
Madge and similar soils: 5 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

CVRD—Cottonwood-Vinson-Rock outcrop complex, 1 to 8 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Cottonwood and Similar Soils

Composition: 42 percent

Geomorphic setting: Hills on karstland

Position on landform: Interfluves and side slopes

Parent material: Residuum weathered from gypsum

Slope: 1 to 8 percent

Runoff class: Very high

Depth to lithic bedrock: 3 to 14 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Well drained

Available water capacity: About 1.2 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 7s

Ecological site ID and name: R078BY076TX, Gyp PE 25-36

Typical profile:

A—0 to 5 inches; silt loam

Cy—5 to 8 inches; gypsiferous silt loam

Cr—8 to 15 inches; bedrock

R—15 to 20 inches; bedrock

Soil Survey of Jackson County, Oklahoma

Location of typical profile: 3,600 feet south and 1,650 feet east of the northwest corner of sec. 25, T. 1 N., R. 23 W.; latitude—34 degrees, 31 minutes, 34 seconds N.; longitude—99 degrees, 34 minutes, 23 seconds W.; USGS quadrangle—Prairie Hill

Characteristics of Vinson and Similar Soils

Composition: 25 percent

Geomorphic setting: Hills on karstland

Position on landform: Interfluves and side slopes

Parent material: Fine-silty residuum weathered from gypsum

Slope: 1 to 5 percent

Runoff class: High

Depth to lithic bedrock: 20 to 40 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Well drained

Available water capacity: About 4.2 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078BY079TX, Loamy PE 25-36

Typical profile:

A—0 to 4 inches; silt loam

Bw—4 to 15 inches; silty clay loam

Bk—15 to 22 inches; silty clay loam

Cr—22 to 28 inches; bedrock

R—28 to 60 inches; bedrock

Location of typical profile: 3,200 feet south and 1,700 feet east of the northwest corner of sec. 25, T. 1 N., R. 23 W.; latitude—34 degrees, 31 minutes, 34 seconds N.; longitude—99 degrees, 34 minutes, 23 seconds W.; USGS quadrangle—Prairie Hill

Characteristics of Rock Outcrop

Composition: 23 percent

Geomorphic setting: Hills on karstland

Position on landform: Interfluves and side slopes

Kind of rock: Gypsum

Slope: 1 to 8 percent

Runoff class: Very high

Depth to lithic bedrock: 0 to 3 inches

Slowest permeability class within a depth of 80 inches: Very slow

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 8s

Ecological site ID and name: None assigned

Soil Survey of Jackson County, Oklahoma

Location of typical area: 3,400 feet south and 1,700 feet east of the northwest corner of sec. 25, T. 1 N., R. 23 W.; latitude—34 degrees, 31 minutes, 36 seconds N.; longitude—99 degrees, 31 minutes, 39 seconds W.; USGS quadrangle—Prairie Hill

Additional Components

Aspermont and similar soils: 7 percent
Spur and similar soils: 3 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

DAM—Dams

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 59 to 64 degrees F

Frost-free period: 200 to 230 days

Note: These structures are upstream flood-control dams.

Characteristics of Dams

Composition: 100 percent

Geomorphic setting: Artificial levees

Kind of material: Mine spoil or earthy fill

Slope: 0 to 45 percent

Runoff class: Very high

Depth: More than 60 inches

Slowest permeability class within a depth of 80 inches: Slow

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 8s

Ecological site ID and name: None assigned

Location of typical area: 1,800 feet south and 2,500 feet east of the northwest corner of sec. 30, T. 3 N., R. 22 W.; latitude—34 degrees, 42 minutes, 19 seconds N.; longitude—99 degrees, 33 minutes, 11 seconds W.; USGS quadrangle—Duke

DcbB—Decobb very fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Decobb and Similar Soils

Composition: 87 percent

Geomorphic setting: Hills on uplands

Position on landform: Interfluves and base slopes

Parent material: Residuum weathered from sandstone

Slope: 1 to 3 percent

Runoff class: Low

Depth to paralithic bedrock: 60 to 80 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Well drained

Available water capacity: About 8.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

Ap—0 to 8 inches; very fine sandy loam

A—8 to 18 inches; loam

Bt—18 to 50 inches; sandy clay loam

BC—50 to 63 inches; fine sandy loam

Cr—63 to 80 inches; bedrock

Location of typical profile: 1,720 feet north and 200 feet east of the southwest corner of sec. 6, T. 1 S., R. 20 W.; latitude—34 degrees, 29 minutes, 53 seconds N.; longitude—99 degrees, 20 minutes, 28 seconds W.; USGS quadrangle—Elmer

Additional Components

Cobb and similar soils: 8 percent

Madge and similar soils: 5 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"
"Engineering" and "Soil Properties"

DeSD—Devol and Springer loamy sands, 3 to 8 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Devol and Similar Soils

Composition: 60 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Dunes

Parent material: Coarse-loamy eolian sands

Slope: 3 to 8 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Well drained

Available water capacity: About 6.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078CY105TX, Loamy Sand Prairie PE 31-44

Typical profile:

Ap—0 to 8 inches; loamy sand

Bt1—8 to 28 inches; fine sandy loam

Bt2—28 to 47 inches; fine sandy loam

BC—47 to 62 inches; loamy sand

C—62 to 80 inches; loamy sand

Location of typical profile: 850 feet north and 1,700 feet west of the southeast corner of sec. 35, T. 7 N., R. 21 W.; latitude—35 degrees, 1 minutes, 55 seconds N.; longitude—99 degrees, 23 minutes, 1 seconds W.; USGS quadrangle—Lake Creek

Characteristics of Springer and Similar Soils

Composition: 27 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Dunes

Parent material: Coarse-loamy eolian sands over loamy alluvium

Slope: 3 to 8 percent

Soil Survey of Jackson County, Oklahoma

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 5.9 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078CY082TX, Loamy Sand Prairie PE 31-44

Typical profile:

Ap—0 to 15 inches; loamy sand

Bt—15 to 41 inches; fine sandy loam

BC—41 to 52 inches; fine sand

Btb—52 to 70 inches; fine sandy loam

BCb—70 to 80 inches; loamy sand

Location of typical profile: 2,050 feet south and 1,300 feet east of the northwest corner of sec. 29, T. 5 N., R. 21 W.; latitude—34 degrees, 52 minutes, 48 seconds N.; longitude—99 degrees, 26 minutes, 41 seconds W.; USGS quadrangle—Granite

Additional Components

Eda and similar soils: 6 percent

Nobscot and similar soils: 4 percent

Grandfield and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

EatA—Eastall silty clay, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Circular, 3 to 50 acres

Note: Ponding affects this map unit during winter and spring in years of average or above average precipitation. The duration of the ponding is long or very long.

Characteristics of Eastall and Similar Soils

Composition: 94 percent

Geomorphic setting: Potholes on karstland

Parent material: Clayey lacustrine deposits

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Very slow

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Poorly drained

Available water capacity: About 8.9 inches

The top of the seasonal high water table: At the surface

Flooding: None

Ponding: Occasional

Interpretive groups

Land capability (nonirrigated): 3w

Ecological site ID and name: R078BY078TX, Lakebed PE 25-36

Typical profile:

A—0 to 12 inches; silty clay

Bw—12 to 19 inches; clay

Bss1—19 to 56 inches; clay

Bss2—56 to 76 inches; silty clay

Bkss—76 to 95 inches; silty clay loam

Location of typical profile: 2,500 feet north and 2,100 feet west of the southeast corner of sec. 34, T. 1 N., R. 23 W.; latitude—34 degrees, 30 minutes, 50 seconds N.; longitude—99 degrees, 36 minutes, 13 seconds W.; USGS quadrangle—Prairie Hill

Additional Components

Hollister and similar soils: 3 percent

Nipsum and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

EdsB—Eda sand, 0 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Soil Survey of Jackson County, Oklahoma

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Eda and Similar Soils

Composition: 82 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Interdune areas

Parent material: Sandy eolian material

Slope: 0 to 3 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Rapid

Slowest permeability class within a depth of 80 inches: Rapid

Drainage class: Somewhat excessively drained

Available water capacity: About 3.9 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY017OK, Deep Sand Savannah

Typical profile:

Ap—0 to 11 inches; sand

E/Bt—11 to 35 inches; loamy sand

C—35 to 80 inches; sand

Location of typical profile: 2,100 feet north and 475 feet west of the southeast corner of sec. 17, T. 4 N., R. 19 W.; latitude—34 degrees, 49 minutes, 4 seconds N.; longitude—99 degrees, 12 minutes, 49 seconds W.; USGS quadrangle—Warren

Additional Components

Nobscot and similar soils: 10 percent

Heatly and similar soils: 5 percent

Devol and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

EdsD—Eda sand, 3 to 8 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Eda and Similar Soils

Composition: 82 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Dunes

Parent material: Sandy eolian material

Slope: 3 to 8 percent

Runoff class: Very low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Rapid

Slowest permeability class within a depth of 80 inches: Rapid

Drainage class: Somewhat excessively drained

Available water capacity: About 3.9 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078CY017OK, Deep Sand Savannah

Typical profile:

Ap—0 to 13 inches; sand

E/Bt—13 to 50 inches; loamy sand

C—50 to 80 inches; sand

Location of typical profile: 2,500 feet south and 1,900 feet west of the northeast corner of sec. 33, T. 4 N., R. 20 W.; latitude—34 degrees, 46 minutes, 35 seconds N.; longitude—99 degrees, 18 minutes, 21 seconds W.; USGS quadrangle—Blair

Additional Components

Nobscot and similar soils: 10 percent

Devol and similar soils: 5 percent

Heatly and similar soils: 3 percent

Management

Major uses: Pasture and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

EdsF—Eda sand, 8 to 15 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Soil Survey of Jackson County, Oklahoma

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Eda and Similar Soils

Composition: 85 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Dunes

Parent material: Sandy eolian material

Slope: 8 to 15 percent

Runoff class: Very low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Rapid

Slowest permeability class within a depth of 80 inches: Rapid

Drainage class: Somewhat excessively drained

Available water capacity: About 3.8 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6e

Ecological site ID and name: R078CY017OK, Deep Sand Savannah

Typical profile:

A—0 to 18 inches; sand

E/Bt—18 to 40 inches; fine sand

C—40 to 80 inches; fine sand

Location of typical profile: 1,550 feet south and 2,100 feet west of the northeast corner of sec. 14, T. 3 N., R. 20 W.; latitude—34 degrees, 44 minutes, 7 seconds N.; longitude—99 degrees, 16 minutes, 14 seconds W.; USGS quadrangle—Altus

Additional Components

Nobscot and similar soils: 10 percent

Devol and similar soils: 3 percent

Heatly and similar soils: 2 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

FayB—Farry fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,400 to 2,000 feet

Soil Survey of Jackson County, Oklahoma

Mean annual precipitation: 22 to 26 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days
Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Farry and Similar Soils

Composition: 85 percent
Geomorphic setting: Terraces on alluvial plains
Position on landform: Treads
Parent material: Loamy alluvium
Slope: 1 to 3 percent
Runoff class: Low
Depth: More than 60 inches
Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate
Slowest permeability class within a depth of 80 inches: Moderate
Drainage class: Well drained
Available water capacity: About 8.1 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Flooding: None
Ponding: None
Interpretive groups
Land capability (nonirrigated): 2e
Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

Ap—0 to 10 inches; fine sandy loam
Bt—10 to 36 inches; sandy clay loam
BC—36 to 50 inches; sandy loam
C—50 to 80 inches; sandy loam

Location of typical profile: 350 feet north and 1,400 feet west of the southeast corner of sec. 33, T. 4 N., R. 19 W.; latitude—34 degrees, 46 minutes, 10 seconds N.; longitude—99 degrees, 11 minutes, 56 seconds W.; USGS quadrangle—Warren

Additional Components

Arnett and similar soils: 10 percent
McKnight and similar soils: 5 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation" section
"Engineering" and "Soil Properties"

FraB—Frankirk loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C
General location in the county: Mainly the western part
Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 27 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days
Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Frankirk and Similar Soils

Composition: 80 percent
Geomorphic setting: Terraces on alluvial plains
Position on landform: Treads
Parent material: Loamy and/or clayey alluvium
Slope: 1 to 3 percent
Runoff class: Medium
Depth: More than 60 inches
Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately slow
Slowest permeability class within a depth of 80 inches: Moderately slow
Drainage class: Well drained
Available water capacity: About 9.2 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Flooding: None
Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e
Ecological site ID and name: R078CY056OK, Loamy Prairie

Typical profile:

Ap—0 to 6 inches; loam
Bt1—6 to 18 inches; clay loam
Bt2—18 to 52 inches; clay loam
Bk—52 to 65 inches; loam
Ck—65 to 80 inches; loam

Location of typical profile: 250 feet south and 1,600 feet east of the northwest corner of sec. 23, T. 1 S., R. 24 W.; latitude—34 degrees, 27 minutes, 50 seconds N.; longitude—99 degrees, 41 minutes, 7 seconds W.; USGS quadrangle—Eldorado

Additional Components

Madge and similar soils: 10 percent
Roark and similar soils: 10 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

GdfB—Grandfield fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Soil Survey of Jackson County, Oklahoma

Elevation: 1,000 to 2,000 feet
Mean annual precipitation: 22 to 28 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days
Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Grandfield and Similar Soils

Composition: 80 percent
Geomorphic setting: Sand sheets on alluvial plains
Position on landform: Hummocks
Parent material: Loamy alluvium and/or eolian deposits
Slope: 1 to 3 percent
Runoff class: Low
Depth: More than 60 inches
Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate
Slowest permeability class within a depth of 80 inches: Moderate
Drainage class: Well drained
Available water capacity: About 8.0 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Flooding: None
Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e
Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 15 inches; fine sandy loam
Bt1—15 to 32 inches; sandy clay loam
Bt2—32 to 49 inches; sandy clay loam
BC—49 to 56 inches; fine sandy loam
C—56 to 80 inches; fine sandy loam

Location of typical profile: 100 feet north and 500 feet west of the southeast corner of sec. 31, T. 3 N., R. 18 W.; latitude—34 degrees, 40 minutes, 55 seconds N.; longitude—99 degrees, 7 minutes, 30 seconds W.; USGS quadrangle—Headrick

Additional Components

Devol and similar soils: 10 percent
Ozark and similar soils: 10 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

GfGB—Grandmore and Grandfield fine sandy loams, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Grandmore and Similar Soils

Composition: 61 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Hummocks

Parent material: Loamy alluvium over clayey alluvium

Slope: 1 to 3 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderately slow

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Moderately well drained

Available water capacity: About 8.9 inches

Depth to the top of the seasonal high water table: 3.3 to 5.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 7 inches; fine sandy loam

Bt1—7 to 24 inches; sandy clay loam

Bt2—24 to 43 inches; fine sandy loam

2Bt—43 to 70 inches; clay loam

2BC—70 to 80 inches; clay loam

Location of typical profile: 1,000 feet south and 1,600 feet west of the northeast corner of sec. 6, T. 2 N., R. 19 W.; latitude—34 degrees, 40 minutes, 43 seconds N.; longitude—99 degrees, 14 minutes, 3 seconds W.; USGS quadrangle—Headrick

Characteristics of Grandfield and Similar Soils

Composition: 32 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Hummocks

Parent material: Loamy alluvium and/or eolian deposits

Slope: 1 to 3 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 8.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 8 inches; fine sandy loam

Bt1—8 to 17 inches; sandy clay loam

Bt2—17 to 55 inches; sandy clay loam

BC—55 to 72 inches; fine sandy loam

C—72 to 80 inches; fine sandy loam

Location of typical profile: 1,050 feet south and 2,300 feet west of the northeast corner of sec. 6, T. 2 N., R. 19 W.; latitude—34 degrees, 40 minutes, 42 seconds N.; longitude—99 degrees, 14 minutes, 10 seconds W.; USGS quadrangle—Headrick

Additional Components

Devol and similar soils: 7 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

GIGB—Grandmore and Grandfield loamy sands, 0 to 3 percent slopes

Map Unit Setting (fig. 18)

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Grandmore and Similar Soils

Composition: 65 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Hummocks

Parent material: Loamy alluvium over clayey alluvium

Slope: 0 to 3 percent

Runoff class: Low



Figure 18.—An area of Grandmore and Grandfield loamy sands, 0 to 3 percent slopes, that previously was cultivated and has been sprigged to bermudagrass.

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately slow

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Moderately well drained

Available water capacity: About 8.2 inches

Depth to the top of the seasonal high water table: 3.3 to 5.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY105TX, Loamy Sand Prairie PE 31-44

Typical profile:

A—0 to 11 inches; loamy sand

Bt1—11 to 22 inches; sandy clay loam

Bt2—22 to 42 inches; fine sandy loam

2Bt—42 to 72 inches; clay

2BC—72 to 80 inches; clay loam

Location of typical profile: 450 feet north and 400 feet west of the southeast corner of sec. 21, T. 4 N., R. 20 W.; latitude—34 degrees, 47 minutes, 57 seconds N.; longitude—99 degrees, 18 minutes, 2 seconds W.; USGS quadrangle—Blair

Characteristics of Grandfield and Similar Soils

Composition: 25 percent

Geomorphic setting: Sand sheets on alluvial plains

Soil Survey of Jackson County, Oklahoma

Position on landform: Hummocks

Parent material: Loamy alluvium and/or eolian deposits

Slope: 0 to 3 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 7.8 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY105TX, Loamy Sand Prairie PE 31-44

Typical profile:

A—0 to 8 inches; loamy sand

Bt1—8 to 28 inches; sandy clay loam

Bt2—28 to 55 inches; sandy clay loam

BC—55 to 75 inches; fine sandy loam

C—75 to 80 inches; fine sandy loam

Location of typical profile: 650 feet north and 400 feet west of the southeast corner of sec. 21, T. 4 N., R. 20 W.; latitude—34 degrees, 48 minutes, 0 seconds N.; longitude—99 degrees, 18 minutes, 0 seconds W.; USGS quadrangle—Blair

Additional Components

Devol and similar soils: 5 percent

Headrick and similar soils: 5 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

GlsB—Grandfield loamy sand, 0 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Grandfield and Similar Soils

Composition: 84 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Hummocks

Parent material: Loamy alluvium and/or eolian deposits

Slope: 0 to 3 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 7.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY105TX, Loamy Sand Prairie PE 31-44

Typical profile:

A—0 to 7 inches; loamy sand

Bt1—7 to 27 inches; sandy clay loam

Bt2—27 to 40 inches; sandy clay loam

BC—40 to 54 inches; fine sandy loam

C—54 to 80 inches; fine sandy loam

Location of typical profile: 2,400 feet north and 1,460 feet east of the southwest corner of sec. 35, T. 3 N., R. 19 W.; latitude—34 degrees, 41 minutes, 17 seconds N.; longitude—99 degrees, 10 minutes, 16 seconds W.; USGS quadrangle—Headrick

Additional Components

Grandmore and similar soils: 8 percent

Devol and similar soils: 6 percent

Ozark and similar soils: 2 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

GlsD—Grandfield loamy sand, 3 to 8 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Soil Survey of Jackson County, Oklahoma

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Grandfield and Similar Soils

Composition: 82 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Dunes

Parent material: Loamy alluvium and/or eolian deposits

Slope: 3 to 8 percent

Runoff class: Medium

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 7.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078CY105TX, Loamy Sand Prairie PE 31-44

Typical profile:

A—0 to 10 inches; loamy sand

Bt1—10 to 35 inches; sandy clay loam

Bt2—35 to 55 inches; sandy clay loam

BC—55 to 72 inches; fine sandy loam

C—72 to 80 inches; fine sandy loam

Location of typical profile: 2,400 feet north and 1,850 feet west of the southeast corner of sec. 18, T. 2 N., R. 19 W.; latitude—34 degrees, 38 minutes, 39 seconds N.; longitude—99 degrees, 14 minutes, 7 seconds W.; USGS quadrangle—Headrick

Additional Components

Devol and similar soils: 8 percent

Grandmore and similar soils: 5 percent

Heatly and similar soils: 5 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

GmuA—Gracemont fine sandy loam, saline, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 250 acres

Characteristics of Gracemont and Similar Soils

Composition: 90 percent

Geomorphic setting: Flood plains in river valleys

Parent material: Coarse-loamy alluvium

Slope: 0 to 1 percent

Runoff class: High

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Somewhat poorly drained

Available water capacity: About 6.3 inches

Depth to the top of the seasonal high water table: 0.5 foot to 1.5 feet

Flooding: Occasional

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 4s

Ecological site ID and name: R078XY097OK, Subirrigated (saline)

Typical profile:

A—0 to 6 inches; fine sandy loam

C1—6 to 20 inches; loam

C2—20 to 80 inches; sandy loam

Location of typical profile: 1,400 feet north and 2,300 feet west of the southeast corner of sec. 33, T. 3 N., R. 21 W.; latitude—34 degrees, 41 minutes, 6 seconds N.; longitude—99 degrees, 24 minutes, 36 seconds W.; USGS quadrangle—Martha

Additional Components

Gracemore and similar soils: 5 percent

Westola and similar soils: 5 percent

Management

Major use: Pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

“Recreation”

“Engineering” and “Soil Properties”

GmwA—Gracemont fine sandy loam, saline, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 30 to 600 acres

Characteristics of Gracemont and Similar Soils

Composition: 87 percent

Geomorphic setting: Flood plains in river valleys

Parent material: Coarse-loamy alluvium

Slope: 0 to 1 percent

Runoff class: High

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Somewhat poorly drained

Available water capacity: About 7.5 inches

Depth to the top of the seasonal high water table: 0.5 foot to 1.5 feet

Flooding: Frequent

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 5s

Ecological site ID and name: R078XY097OK, Subirrigated (saline)

Typical profile:

A—0 to 4 inches; fine sandy loam

C1—4 to 35 inches; fine sandy loam

C2—35 to 80 inches; loamy sand

Location of typical profile: 1,200 feet south and 3,850 feet west of the northeast corner of sec. 28, T. 3 N., R. 21 W.; latitude—34 degrees, 42 minutes, 37 seconds N.; longitude—99 degrees, 24 minutes, 58 seconds W.; USGS quadrangle—Martha

Additional Components

Ezell and similar soils: 5 percent

Gracemore and similar soils: 5 percent

Retrop and similar soils: 3 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

GsEA—Gracemore and Ezell soils, saline, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 30 to 600 acres

Characteristics of Gracemore and Similar Soils

Composition: 80 percent

Geomorphic setting: Flood plains in river valleys

Parent material: Sandy alluvium

Slope: 0 to 1 percent

Runoff class: High

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Somewhat poorly drained

Available water capacity: About 4.5 inches

Depth to the top of the seasonal high water table: 0.5 foot to 1.5 feet

Flooding: Frequent

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 5s

Ecological site ID and name: R078XY097OK, Subirrigated (saline)

Typical profile:

A—0 to 8 inches; loam

C—8 to 72 inches; sand

Location of typical profile: 2,640 feet south and 1,125 feet west of the northeast corner of sec. 4, T. 2 S., R. 21 W.; latitude—34 degrees, 24 minutes, 49 seconds N.; longitude—99 degrees, 23 minutes, 53 seconds W.; USGS quadrangle—Ayers Island

Characteristics of Ezell and Similar Soils

Composition: 15 percent

Geomorphic setting: Flood plains in river valleys

Parent material: Sandy alluvium

Soil Survey of Jackson County, Oklahoma

Slope: 0 to 1 percent

Runoff class: High

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Very poorly drained

Available water capacity: About 5.0 inches

The top of the seasonal high water table: At the surface

Flooding: Frequent

Ponding: Occasional

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 5w

Ecological site ID and name: R078XY090OK, Meadow

Typical profile:

A—0 to 8 inches; loam

C1—8 to 20 inches; fine sand

C2—20 to 80 inches; stratified sand and loam

Location of typical profile: 2,550 feet south and 250 feet west of the northeast corner of sec. 4, T. 2 S., R. 21 W.; latitude—34 degrees, 24 minutes, 50 seconds N.; longitude—99 degrees, 23 minutes, 44 seconds W.; USGS quadrangle—Ayers Island

Additional Components

Gracemont and similar soils: 5 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

HdmA—Hardeman fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Hardeman and Similar Soils

Composition: 88 percent

Geomorphic setting: Stream terraces in river valleys

Soil Survey of Jackson County, Oklahoma

Position on landform: Treads

Parent material: Coarse-loamy alluvium and/or eolian deposits

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Well drained

Available water capacity: About 7.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 16 inches; fine sandy loam

Bw—16 to 55 inches; fine sandy loam

BC—55 to 72 inches; fine sandy loam

C—72 to 80 inches; fine sandy loam

Location of typical profile: 2,550 feet north and 2,400 feet west of the southeast corner of sec. 2, T. 2 S., R. 20 W.; latitude—34 degrees, 24 minutes, 49 seconds N.; longitude—99 degrees, 15 minutes, 44 seconds W.; USGS quadrangle—Elmer

Additional Components

Devol and similar soils: 5 percent

Farry and similar soils: 5 percent

Arnett and similar soils: 2 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

HdmB—Hardeman fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Soil Survey of Jackson County, Oklahoma

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Hardeman and Similar Soils

Composition: 88 percent

Geomorphic setting: Stream terraces in river valleys

Position on landform: Treads

Parent material: Coarse-loamy alluvium and/or eolian deposits

Slope: 1 to 3 percent

Runoff class: Very low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Well drained

Available water capacity: About 7.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 6 inches; fine sandy loam

Bw—6 to 46 inches; loam

Bk—46 to 80 inches; fine sandy loam

Location of typical profile: 2,650 feet north and 1,500 feet west of the southeast corner of sec. 31, T. 3 N., R. 18 W.; latitude—34 degrees, 41 minutes, 20 seconds N.; longitude—99 degrees, 7 minutes, 44 seconds W.; USGS quadrangle—Headrick

Additional Components

Devol and similar soils: 5 percent

Farry and similar soils: 5 percent

Arnett and similar soils: 2 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

HdmC—Hardeman fine sandy loam, 3 to 5 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Soil Survey of Jackson County, Oklahoma

Elevation: 1,000 to 2,000 feet
Mean annual precipitation: 22 to 28 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days
Shape and size of areas: Irregular, 5 to 100 acres

Characteristics of Hardeman and Similar Soils

Composition: 90 percent
Geomorphic setting: Stream terraces in river valleys
Position on landform: Risers
Parent material: Coarse-loamy alluvium and/or eolian deposits
Slope: 3 to 5 percent
Runoff class: Very low
Depth: More than 60 inches
Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid
Slowest permeability class within a depth of 80 inches: Moderately rapid
Drainage class: Well drained
Available water capacity: About 7.7 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Flooding: None
Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e
Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 13 inches; fine sandy loam
Bw—13 to 35 inches; loam
Bk—35 to 62 inches; loam
BC—62 to 80 inches; fine sandy loam

Location of typical profile: 1,100 feet south and 1,800 feet west of the northeast corner of sec. 31, T. 3 N., R. 18 W.; latitude—34 degrees, 41 minutes, 35 seconds N.; longitude—99 degrees, 7 minutes, 45 seconds W.; USGS quadrangle—Headrick

Additional Components

Fortyone and similar soils: 5 percent
McKnight and similar soils: 3 percent
Arnett and similar soils: 2 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

HdmE—Hardeman fine sandy loam, 5 to 12 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Hardeman and Similar Soils

Composition: 90 percent

Geomorphic setting: Stream terraces in river valleys

Position on landform: Risers

Parent material: Coarse-loamy alluvium and/or eolian deposits

Slope: 5 to 12 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Well drained

Available water capacity: About 7.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

A—0 to 12 inches; fine sandy loam

Bw—12 to 28 inches; fine sandy loam

Bk—28 to 60 inches; fine sandy loam

C—60 to 80 inches; loamy fine sand

Location of typical profile: 2,050 feet north and 200 feet east of the southwest corner of sec. 32, T. 1 S., R. 22 W.; latitude—34 degrees, 25 minutes, 36 seconds N.; longitude—99 degrees, 32 minutes, 0 seconds W.; USGS quadrangle—Quanah NE

Additional Components

Fortyone and similar soils: 5 percent

McKnight and similar soils: 3 percent

Burford and similar soils: 2 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

HeyB—Heatly sand, 0 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 22 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Heatly and Similar Soils

Composition: 72 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Hummocks

Parent material: Sandy eolian material over loamy alluvium

Slope: 0 to 3 percent

Runoff class: Very low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 6.9 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078CY017OK, Deep Sand Savannah

Typical profile:

A—0 to 22 inches; sand

Bt1—22 to 43 inches; sandy clay loam

Bt2—43 to 62 inches; sandy loam

BC—62 to 72 inches; sandy loam

C—72 to 80 inches; sandy loam

Location of typical profile: 1,300 feet south and 850 feet east of the northwest corner of sec. 21, T. 4 N., R. 19 W.; latitude—34 degrees, 48 minutes, 32 seconds N.; longitude—99 degrees, 12 minutes, 33 seconds W.; USGS quadrangle—Warren

Additional Components

Delwin and similar soils: 12 percent

Grandfield and similar soils: 10 percent

Nobscot and similar soils: 6 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

HkfA—Headrick fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Headrick and Similar Soils

Composition: 76 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Flats

Parent material: Loamy alluvium over clayey alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderately slow

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Somewhat poorly drained

Available water capacity: About 8.5 inches

Depth to the top of the seasonal high water table: 1.7 to 3.3 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY089OK, Seep Meadow

Typical profile:

A—0 to 9 inches; fine sandy loam

Bt—9 to 45 inches; sandy clay loam

2Bt—45 to 72 inches; clay

2BCK—72 to 80 inches; clay loam

Location of typical profile: 950 feet south and 2,300 feet east of the northwest corner of sec. 8, T. 3 N., R. 20 W.; latitude—34 degrees, 45 minutes, 6 seconds N.; longitude—99 degrees, 19 minutes, 37 seconds W.; USGS quadrangle—Blair

Additional Components

Grandmore and similar soils: 13 percent

Grandfield and similar soils: 8 percent

Devol and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

HksA—Headrick loamy sand, 0 to 1 percent slopes

Map Unit Setting (fig. 19)

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Headrick and Similar Soils

Composition: 83 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Flats

Parent material: Loamy alluvium over clayey alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderately slow



Figure 19.—An area of Headrick loamy sand, 0 to 1 percent slopes, that previously was cultivated and has been reestablished to a mixture of native grasses.

Soil Survey of Jackson County, Oklahoma

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Somewhat poorly drained

Available water capacity: About 8.5 inches

Depth to the top of the seasonal high water table: 1.7 to 3.3 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY089OK, Seep Meadow

Typical profile:

A—0 to 5 inches; loamy sand

Bt—5 to 32 inches; sandy clay loam

2Bt—32 to 66 inches; clay loam

2BCK—66 to 80 inches; sandy clay loam

Location of typical profile: 2,400 feet north and 2,250 feet west of the southeast corner of sec. 4, T. 2 N., R. 18 W.; latitude—34 degrees, 40 minutes, 25 seconds N.; longitude—99 degrees, 5 minutes, 44 seconds W.; USGS quadrangle—Long Mountain

Additional Components

Grandmore and similar soils: 13 percent

Devol and similar soils: 2 percent

Grandfield and similar soils: 2 percent

Management

Major use: Pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

HolA—Hollister silty clay loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 24 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Hollister and Similar Soils

Composition: 91 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Clayey alluvium and/or lacustrine deposits

Slope: 0 to 1 percent

Runoff class: High

Soil Survey of Jackson County, Oklahoma

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Very slow

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Well drained

Available water capacity: About 9.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2c

Ecological site ID and name: R078CY096TX, Clay Loam PE 31-44

Typical profile:

Ap—0 to 9 inches; silty clay loam

Bw—9 to 23 inches; silty clay

Bss—23 to 72 inches; silty clay

Bk—72 to 110 inches; clay

2C—110 to 138 inches; clay

Location of typical profile: 540 feet north and 2,470 feet east of the southwest corner of sec. 30, T. 1 N., R. 21 W.; latitude—34 degrees, 31 minutes, 23 seconds N.;

longitude—99 degrees, 26 minutes, 55 seconds W.; USGS quadrangle—Olustee

Additional Components

Tillman and similar soils: 9 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

HrAC—Harmon-Aspermont complex, 1 to 5 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 5 to 100 acres

Characteristics of Harmon and Similar Soils

Composition: 50 percent

Geomorphic setting: Hills on karstland

Position on landform: Interfluvies

Soil Survey of Jackson County, Oklahoma

Parent material: Residuum weathered from dolostone over residuum weathered from shale and siltstone

Slope: 1 to 5 percent

Runoff class: Very high

Depth to paralithic bedrock: 6 to 18 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 1.6 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6s

Ecological site ID and name: R078BY091TX, Very Shallow PE 25-36

Typical profile:

Ap—0 to 7 inches; gravelly silt loam

ACk—7 to 16 inches; very gravelly silt loam

Cr—16 to 40 inches; bedrock

Location of typical profile: 550 feet north and 1,350 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.; latitude—34 degrees, 37 minutes, 28 seconds N.; longitude—99 degrees, 36 minutes, 34 seconds W.; USGS quadrangle—Prairie Hill

Characteristics of Aspermont and Similar Soils

Composition: 44 percent

Geomorphic setting: Hills on karstland

Position on landform: Interfluves

Parent material: Fine-silty colluvium over silty and clayey residuum weathered from shale and siltstone

Slope: 1 to 5 percent

Runoff class: Medium

Depth to densic bedrock: 40 to 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 9.4 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078BY079TX, Loamy PE 25-36

Typical profile:

Ap—0 to 5 inches; silt loam

Bk—5 to 40 inches; silty clay loam

BCK—40 to 50 inches; silty clay loam

Cd—50 to 80 inches; silty clay

Location of typical profile: 280 feet north and 1,300 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.; latitude—34 degrees, 37 minutes, 27 seconds N.; longitude—99 degrees, 36 minutes, 34 seconds W.; USGS quadrangle—Prairie Hill

Additional Components

Knoco and similar soils: 3 percent
La Casa and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

JesC—Jester fine sand, 1 to 5 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Jester and Similar Soils

Composition: 87 percent

Geomorphic setting: Dunes in river valleys

Parent material: Sandy eolian material over sandy alluvium

Slope: 1 to 5 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Rapid

Slowest permeability class within a depth of 80 inches: Rapid

Drainage class: Excessively drained

Available water capacity: About 3.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078CY107TX, Sand Hills PE 31-44

Typical profile:

A—0 to 7 inches; fine sand
C1—7 to 45 inches; fine sand
C2—45 to 80 inches; sand

Soil Survey of Jackson County, Oklahoma

Location of typical profile: 900 feet south and 1,800 feet west of the northeast corner of sec. 3, T. 4 N., R. 19 W.; latitude—34 degrees, 51 minutes, 13 seconds N.; longitude—99 degrees, 11 minutes, 18 seconds W.; USGS quadrangle—Warren

Additional Components

Lincoln and similar soils: 13 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

JesF—Jester fine sand, 5 to 20 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Jester and Similar Soils

Composition: 96 percent

Geomorphic setting: Dunes in river valleys

Parent material: Sandy eolian material over sandy alluvium

Slope: 5 to 20 percent

Runoff class: Very low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Rapid

Slowest permeability class within a depth of 80 inches: Rapid

Drainage class: Excessively drained

Available water capacity: About 3.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6e

Ecological site ID and name: R078CY107TX, Sand Hills PE 31-44

Typical profile:

A—0 to 8 inches; fine sand

C—8 to 80 inches; fine sand

Location of typical profile: 100 feet south and 200 feet east of the northwest corner of sec. 34, T. 3 N., R. 18 W.; latitude—34 degrees, 41 minutes, 45 seconds N.;

longitude—99 degrees, 5 minutes, 15 seconds W.; USGS quadrangle—Long Mountain

Additional Components

Devol and similar soils: 4 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

KcRG—Knoco soils and Rock outcrop, 12 to 40 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Knoco and Similar Soils

Composition: 45 percent

Geomorphic setting: Escarpments on uplands

Position on landform: Side slopes

Parent material: Residuum weathered from clayey shale

Slope: 12 to 40 percent

Runoff class: Very high

Depth to densic bedrock: 3 to 20 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 0.8 inch

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 7s

Ecological site ID and name: R078BY692TX, Rocky Hill PE 25-36

Typical profile:

A—0 to 3 inches; bouldery silty clay

C—3 to 9 inches; silty clay

Cd—9 to 60 inches; clay

Soil Survey of Jackson County, Oklahoma

Location of typical profile: 1,100 feet south and 150 feet west of the northeast corner of sec. 15, T. 4 N., R. 22 W.; latitude—34 degrees, 49 minutes, 26 seconds N.; longitude—99 degrees, 29 minutes, 37 seconds W.; USGS quadrangle—Hester

Characteristics of Rock Outcrop

Composition: 20 percent

Geomorphic setting: Escarpments on uplands

Position on landform: Interfluves and side slopes

Kind of rock: Dolostone and/or gypsum

Slope: 12 to 40 percent

Runoff class: Very high

Depth to lithic bedrock: 0 to 3 inches

Slowest permeability class within a depth of 80 inches: Impermeable

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 8s

Ecological site ID and name: None assigned

Location of typical area: 1,100 feet south and 350 feet west of the northeast corner of sec. 15, T. 4 N., R. 22 W.; latitude—34 degrees, 49 minutes, 26 seconds N.; longitude—99 degrees, 29 minutes, 39 seconds W.; USGS quadrangle—Hester

Additional Components

Vernon and similar soils: 12 percent

Badland: 10 percent

Talpa and similar soils: 8 percent

Cottonwood and similar soils: 5 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

KoBE—Knoco-Badland complex, 1 to 12 percent slopes

Map Unit Setting (fig. 20)

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Knoco and Similar Soils

Composition: 45 percent

Geomorphic setting: Rock pediments on uplands



Figure 20.—An area of Knoco-Badland complex, 1 to 12 percent slopes.

Parent material: Residuum weathered from clayey shale
Slope: 1 to 12 percent
Runoff class: Very high
Depth to densic bedrock: 3 to 20 inches
Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow
Slowest permeability class within a depth of 80 inches: Impermeable
Drainage class: Well drained
Available water capacity: About 1.4 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Flooding: None
Ponding: None

Interpretive groups

Land capability (nonirrigated): 6s

Ecological site ID and name: R078BY092TX, Very Shallow Clay PE 25-36

Typical profile:

A—0 to 6 inches; silty clay

C—6 to 16 inches; clay

Cd—16 to 60 inches; clay

Location of typical profile: 1,300 feet north and 500 feet west of the southeast corner of sec. 21, T. 1 S., R. 22 W.; latitude—34 degrees, 27 minutes, 12 seconds N.; longitude—99 degrees, 30 minutes, 8 seconds W.; USGS quadrangle—Quanah NE

Characteristics of Badland

Composition: 30 percent

Geomorphic setting: Rock pediments on uplands

Kind of material: Clayey shale

Slope: 1 to 12 percent

Runoff class: Very high

Depth to densic bedrock: 0 to 3 inches

Slowest permeability class within a depth of 80 inches: Impermeable

Depth to the top of the seasonal high water table: More than 6.0 feet

Soil Survey of Jackson County, Oklahoma

Flooding: None

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 8s

Ecological site ID and name: None assigned

Location of typical area: 1,650 feet north and 800 feet west of the southeast corner of sec. 21, T. 1 S., R. 22 W.; latitude—34 degrees, 27 minutes, 16 seconds N.; longitude—99 degrees, 30 minutes, 8 seconds W.; USGS quadrangle—Quanah NE

Additional Components

Vernon and similar soils: 10 percent

Beckman and similar soils: 5 percent

Rock outcrop: 5 percent

Treadway and similar soils: 5 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

LacB—La Casa silty clay loam, 1 to 3 percent slopes

Map Unit Setting (fig. 21)

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of La Casa and Similar Soils

Composition: 79 percent

Geomorphic setting: Hills on karstland

Position on landform: Base slopes

Parent material: Silty and clayey alluvium and/or colluvium over silty and clayey residuum

Slope: 1 to 3 percent

Runoff class: High

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer: Slow

Slowest permeability class within a depth of 80 inches: Slow

Drainage class: Well drained

Available water capacity: About 8.6 inches



Figure 21.—An area of La Casa silty clay loam, 1 to 3 percent slopes, that is covered with wheat stubble and encircles an area of Eastall silty clay, 0 to 1 percent slopes, that is devoid of vegetation because it is ponded after spring rains.

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078BY072TX, Clay Loam PE 25-36

Typical profile:

Ap—0 to 6 inches; silty clay loam

Bt—6 to 12 inches; silty clay loam

Btk1—12 to 34 inches; silty clay

Btk2—34 to 64 inches; silty clay loam

BCK—64 to 81 inches; silty clay loam

C—81 to 91 inches; silty clay loam

Location of typical profile: 400 feet north and 500 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.; latitude—34 degrees, 36 minutes, 27 seconds N.; longitude—99 degrees, 36 minutes, 47 seconds W.; USGS quadrangle—Prairie Hill

Additional Components

Nipsum and similar soils: 11 percent

Aspermont and similar soils: 7 percent

Harmon and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

“Engineering” and “Soil Properties”

LDF—Landfill

Map Unit Setting

MLRA: 78C

Location in the county: The Altus municipal landfill, about 8 miles west and 2 miles north of the Jackson County Courthouse in Altus

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 59 to 64 degrees F

Frost-free period: 200 to 230 days

Characteristics of Landfill

Composition: 100 percent

Geomorphic setting: Sanitary landfill

Kind of material: Mine spoil or earthy fill derived from clayey shale

Slope: 0 to 50 percent

Runoff class: Very high

Depth: More than 60 inches

Slowest permeability class within a depth of 80 inches: Impermeable

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 8s

Ecological site ID and name: None assigned

Location of typical area: 1,500 feet south and 2,000 feet west of the northeast corner of sec. 11, T. 2 N., R. 22 W.; latitude—34 degrees, 39 minutes, 45 seconds N.; longitude—99 degrees, 28 minutes, 50 seconds W.; USGS quadrangle—Martha

Management

Major use: The disposal of household refuse, tree and grass trimmings, old tires, and other trash

LnuA—Lincoln loamy sand, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 250 acres

Characteristics of Lincoln and Similar Soils

Composition: 90 percent

Soil Survey of Jackson County, Oklahoma

Geomorphic setting: Flood plains in river valleys

Parent material: Sandy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Rapid

Slowest permeability class within a depth of 80 inches: Rapid

Drainage class: Somewhat excessively drained

Available water capacity: About 3.3 inches

Depth to the top of the seasonal high water table: 5.0 to 8.0 feet

Flooding: Occasional

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3s

Ecological site ID and name: R078XY068OK, Sandy Bottomland

Typical profile:

A—0 to 8 inches; loamy sand

C1—8 to 21 inches; fine sand

C2—21 to 80 inches; stratified sand to loam

Location of typical profile: 1,400 feet south and 800 feet west of the northeast corner of sec. 3, T. 4 N., R. 19 W.; latitude—34 degrees, 51 minutes, 8 seconds N.; longitude—99 degrees, 10 minutes, 45 seconds W.; USGS quadrangle—Warren

Additional Components

Gracemore and similar soils: 5 percent

Westola and similar soils: 5 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

LnWA—Lincoln and Westola soils, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 30 to 600 acres

Characteristics of Lincoln and Similar Soils

Composition: 65 percent

Geomorphic setting: Flood plains in river valleys

Parent material: Sandy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Rapid

Slowest permeability class within a depth of 80 inches: Rapid

Drainage class: Somewhat excessively drained

Available water capacity: About 3.2 inches

Depth to the top of the seasonal high water table: 5.0 to 8.0 feet

Flooding: Frequent

Ponding: None

Interpretive groups

Land capability (nonirrigated): 5w

Ecological site ID and name: R078XY068OK, Sandy Bottomland

Typical profile:

A—0 to 5 inches; loamy sand

C1—5 to 15 inches; loamy sand

C2—15 to 80 inches; stratified sand to loam

Location of typical profile: 200 feet north and 200 feet west of the southeast corner of sec. 34, T. 5 N., R. 19 W.; latitude—34 degrees, 51 minutes, 24 seconds N.; longitude—99 degrees, 11 minutes, 5 seconds W.; USGS quadrangle—Warren

Characteristics of Westola and Similar Soils

Composition: 25 percent

Geomorphic setting: Flood plains in river valleys

Parent material: Coarse-loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Well drained

Available water capacity: About 8.3 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: Frequent

Ponding: None

Interpretive groups

Land capability (nonirrigated): 5w

Ecological site ID and name: R078CY050OK, Loamy Bottomland

Typical profile:

A—0 to 5 inches; fine sandy loam

C1—5 to 30 inches; fine sandy loam

C2—30 to 80 inches; stratified sand to sandy loam

Location of typical profile: 1,000 feet north and 2,400 feet east of the southwest corner of sec. 10, T. 1 N., R. 21 W.; latitude—34 degrees, 34 minutes, 4 seconds

Soil Survey of Jackson County, Oklahoma

N.; longitude—99 degrees, 23 minutes, 44 seconds W.; USGS quadrangle—Olustee

Additional Components

Gracemont and similar soils: 5 percent

Gracemore and similar soils: 5 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

M-W—Miscellaneous Water

Map Unit Setting

MLRA: 78C

General location in the county: Throughout the county

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Characteristics of Miscellaneous Water

Composition: 100 percent

Geomorphic setting: Sewage lagoons

Interpretive groups

Land capability (nonirrigated): None assigned

Ecological site ID and name: None assigned

Location of typical area: 1,700 feet north and 500 feet west of the southeast corner of sec. 26, T. 2 N., R. 21 W.; latitude—34 degrees, 36 minutes, 48 seconds N.; longitude—99 degrees, 22 minutes, 13 seconds W.; USGS quadrangle—Altus

MagA—Madge loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Madge and Similar Soils

Composition: 88 percent

Geomorphic setting: Terraces on alluvial plains

Soil Survey of Jackson County, Oklahoma

Position on landform: Treads

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 9.8 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2c

Ecological site ID and name: R078CY056OK, Loamy Prairie

Typical profile:

Ap—0 to 8 inches; loam

A—8 to 18 inches; loam

Bt1—18 to 26 inches; clay loam

Bt2—26 to 47 inches; clay loam

BCK—47 to 64 inches; loam

C—64 to 80 inches; fine sandy loam

Location of typical profile: 100 feet south and 250 feet west of the northeast corner of sec. 11, T. 1 S., R. 21 W.; latitude—34 degrees, 29 minutes, 35 seconds N.;

longitude—99 degrees, 21 minutes, 37 seconds W.; USGS quadrangle—Elmer

Additional Components

Decobb and similar soils: 6 percent

Tipton and similar soils: 6 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

MagB—Madge loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Madge and Similar Soils

Composition: 90 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Loamy alluvium

Slope: 1 to 3 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 9.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY056OK, Loamy Prairie

Typical profile:

Ap—0 to 11 inches; loam

Bt1—11 to 15 inches; clay loam

Bt2—15 to 22 inches; clay loam

Bt3—22 to 42 inches; sandy clay loam

Bt4—42 to 70 inches; sandy clay loam

BCK—70 to 80 inches; fine sandy loam

Location of typical profile: 1,100 feet south and 400 feet east of the northwest corner of sec. 1, T. 1 S., R. 21 W.; latitude—34 degrees, 30 minutes, 15 seconds N.; longitude—99 degrees, 21 minutes, 30 seconds W.; USGS quadrangle—Altus SE

Additional Components

Decobb and similar soils: 7 percent

Tipton and similar soils: 3 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

MngA—Mangum silty clay loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,000 to 2,000 feet

Soil Survey of Jackson County, Oklahoma

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 250 acres

Characteristics of Mangum and Similar Soils

Composition: 80 percent

Geomorphic setting: Flood plains

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Runoff class: High

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Very slow

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Well drained

Available water capacity: About 9.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: Occasional

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2w

Ecological site ID and name: R078BY070TX, Clayey Bottomland PE 25-36

Typical profile:

A—0 to 7 inches; silty clay loam

Bk—7 to 21 inches; clay

C—21 to 80 inches; stratified silty clay loam to clay

Location of typical profile: 150 feet south and 700 feet east of the northwest corner of sec. 32, T. 3 N., R. 24 W.; latitude—34 degrees, 41 minutes, 43 seconds N.; longitude—99 degrees, 45 minutes, 6 seconds W.; USGS quadrangle—Gould

Additional Components

Clairemont and similar soils: 8 percent

Spur and similar soils: 8 percent

Beckman and similar soils: 4 percent

Management

Major uses: Cropland and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

NipA—Nipsum silty clay loam, 0 to 1 percent slopes

Map Unit Setting (fig. 22)

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet



Figure 22.—An area of Nipsum silty clay loam, 0 to 1 percent slopes, in the foreground. Cottonwood-Vinson-Rock outcrop complex, 1 to 8 percent slopes, is in the background. In the middle of the picture, gypsum bedrock has caved in, forming a sinkhole.

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Nipsum and Similar Soils

Composition: 85 percent

Geomorphic setting: Depressions and drainageways on karstland

Parent material: Clayey alluvium and/or colluvium

Slope: 0 to 1 percent

Runoff class: Medium

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Slow

Drainage class: Well drained

Available water capacity: About 8.6 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2c

Ecological site ID and name: R078BY072TX, Clay Loam PE 25-36

Typical profile:

A—0 to 10 inches; silty clay loam

Bt—10 to 30 inches; silty clay

Bk1—30 to 45 inches; silty clay

Bk2—45 to 80 inches; silty clay loam

Location of typical profile: 800 feet south and 350 feet east of the northwest corner of sec. 15, T. 1 S., R. 23 W.; latitude—34 degrees, 28 minutes, 37 seconds N.;

longitude—99 degrees, 35 minutes, 8 seconds W.; USGS quadrangle—Quanah
NE

Additional Components

La Casa and similar soils: 12 percent
Aspermont and similar soils: 3 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture" section
"Recreation"
"Engineering" and "Soil Properties"

NOTCOM—Area not surveyed, access denied

Map Unit Setting

MLRA: 78C

Location in the county: Altus Air Force Base

Note: Access to examine the soils in this unit was denied. No information about the soils in the unit is included in this survey report.

OakA—Oakley loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Oakley and Similar Soils

Composition: 80 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderately slow

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Well drained

Available water capacity: About 10.6 inches

Depth to the top of the seasonal high water table: 5.0 to 6.6 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY057OK, Limy Prairie

Typical profile:

Ap—0 to 12 inches; loam

Bk1—12 to 43 inches; loam

Bk2—43 to 58 inches; loam

BC—58 to 85 inches; sandy clay loam

C—85 to 95 inches; gravelly sandy loam

2Cd—95 to 100 inches; clay

Location of typical profile: 450 feet north and 1,100 feet west of the southeast corner of sec. 28, T. 3 N., R. 19 W.; latitude—34 degrees, 41 minutes, 51 seconds N.; longitude—99 degrees, 11 minutes, 51 seconds W.; USGS quadrangle—Headrick

Additional Components

Roark and similar soils: 10 percent

Ozark and similar soils: 7 percent

Burford and similar soils: 3 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

OakB—Oakley loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts, but also the southwestern part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Oakley and Similar Soils

Composition: 85 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Loamy alluvium

Slope: 1 to 3 percent

Runoff class: Medium

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately slow

Slowest permeability class within a depth of 80 inches: Moderately slow

Soil Survey of Jackson County, Oklahoma

Drainage class: Well drained

Available water capacity: About 10.3 inches

Depth to the top of the seasonal high water table: 5.0 to 6.6 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY057OK, Limy Prairie

Typical profile:

Ap—0 to 7 inches; loam

Bk1—7 to 41 inches; loam

Bk2—41 to 49 inches; clay loam

BCK—49 to 72 inches; clay loam

Ck—72 to 95 inches; loam

2Cd—95 to 100 inches; clay

Location of typical profile: 2,400 feet south and 1,150 feet east of the northwest corner of sec. 25, T. 1 S., R. 24 W.; latitude—34 degrees, 26 minutes, 37 seconds N.; longitude—99 degrees, 40 minutes, 9 seconds W.; USGS quadrangle—Eldorado

Additional Components

Burford and similar soils: 7 percent

Roark and similar soils: 5 percent

Ozark and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

OzkA—Ozark fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Ozark and Similar Soils

Composition: 80 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Flats

Parent material: Loamy alluvium over silty and clayey residuum weathered from shale

Slope: 0 to 1 percent

Soil Survey of Jackson County, Oklahoma

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately slow

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Moderately well drained

Available water capacity: About 8.5 inches

Depth to the top of the seasonal high water table: 3.3 to 5.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY110TX, Sandy Loam Prairie PE 31-44

Typical profile:

Ap—0 to 11 inches; fine sandy loam

Bt—11 to 24 inches; sandy clay loam

Btk—24 to 59 inches; clay loam

BC—59 to 83 inches; sandy clay loam

C—83 to 105 inches; clay loam

2Cd—105 to 110 inches; clay

Location of typical profile: 500 feet north and 2,000 feet west of the southeast corner of sec. 29, T. 3 N., R. 19 W.; latitude—34 degrees, 41 minutes, 50 seconds N.; longitude—99 degrees, 13 minutes, 3 seconds W.; USGS quadrangle—Headrick

Additional Components

Altus and similar soils: 10 percent

Headrick and similar soils: 5 percent

McKnight and similar soils: 5 percent

Management

Major use: Cropland (fig. 23)



Figure 23.—Cotton in an area of Ozark fine sandy loam, 0 to 1 percent slopes.

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

OzsA—Ozark fine sandy loam, saline, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Ozark and Similar Soils

Composition: 90 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Flats

Parent material: Loamy alluvium over silty and clayey residuum weathered from shale

Slope: 0 to 1 percent

Runoff class: Low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately slow

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Somewhat poorly drained

Available water capacity: About 8.3 inches

Depth to the top of the seasonal high water table: 2.0 to 4.0 feet

Flooding: None

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 4s

Ecological site ID and name: None assigned

Note: Soluble salts have become concentrated in the surface layer because of the removal of native vegetation by cultivation. When cultivated, areas of this soil become saline seeps, where only salt-tolerant species can grow. For information about the original native vegetation, refer to the ecological site data for map unit OzkA (Ozark fine sandy loam, 0 to 1 percent slopes).

Typical profile:

Ap—0 to 14 inches; fine sandy loam

Bt—14 to 25 inches; sandy clay loam

Btk—25 to 50 inches; clay loam

BC—50 to 73 inches; sandy clay loam

C—73 to 100 inches; sandy clay loam

2Cd—100 to 110 inches; clay

Soil Survey of Jackson County, Oklahoma

Location of typical profile: 500 feet south and 2,350 feet east of the northwest corner of sec. 7, T. 2 N., R. 19 W.; latitude—34 degrees, 39 minutes, 55 seconds N.; longitude—99 degrees, 14 minutes, 18 seconds W.; USGS quadrangle—Headrick

Additional Components

Devol and similar soils: 5 percent
Headrick and similar soils: 5 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

“Crops and Pasture”
“Recreation”
“Engineering” and “Soil Properties”

PIT—Pits

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Characteristics of Pits

Composition: 100 percent

Geomorphic setting: Surface-mined areas

Kind of material: Clayey shale

Slope: 0 to 90 percent

Runoff class: Very high

Depth to paralithic bedrock: 0 to 3 inches

Slowest permeability class within a depth of 80 inches: Impermeable

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 8s

Ecological site ID and name: None assigned

Location of typical area: 1,400 feet north and 500 feet east of the southwest corner of sec. 10, T. 1 S., R. 22 W.; latitude—34 degrees, 28 minutes, 49 seconds N.; longitude—99 degrees, 29 minutes, 52 seconds W.; USGS quadrangle—Ayers Island

RakA—Roark loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts, but also the southwestern part

Soil Survey of Jackson County, Oklahoma

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Roark and Similar Soils

Composition: 81 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Loamy and/or clayey alluvium

Slope: 0 to 1 percent

Runoff class: Medium

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Slow

Drainage class: Well drained

Available water capacity: About 10.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2c

Ecological site ID and name: R078CY056OK, Loamy Prairie

Typical profile:

Ap—0 to 10 inches; loam

Bt—10 to 24 inches; clay loam

Btk1—24 to 34 inches; clay loam

Btk2—34 to 49 inches; clay loam

Btk3—49 to 67 inches; loam

2C—67 to 80 inches; clay loam

Location of typical profile: 50 feet south and 1,600 feet west of the northeast corner of sec. 14, T. 3 N., R. 21 W.; latitude—34 degrees, 44 minutes, 22 seconds N.; longitude—99 degrees, 22 minutes, 28 seconds W.; USGS quadrangle—Altus

Additional Components

Tipton and similar soils: 10 percent

Frankirk and similar soils: 5 percent

Ozark and similar soils: 4 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

RKBG—Rock outcrop-Brico complex, 8 to 50 percent slopes

Map Unit Setting

MLRA: 82B

General location in the county: Part of the Wichita Mountains

Elevation: 1,000 to 2,500 feet

Mean annual precipitation: 25 to 30 inches

Mean annual air temperature: 61 to 63 degrees F

Frost-free period: 200 to 220 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Rock Outcrop

Composition: 60 percent

Geomorphic setting: Mountains

Position on landform: Mountain flanks

Kind of rock: Granite

Slope: 8 to 50 percent

Runoff class: Very high

Depth to lithic bedrock: 0 inches

Slowest permeability class within a depth of 80 inches: Impermeable

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 8s

Ecological site ID and name: None assigned

Location of typical area: 1,500 feet south and 2,500 feet east of the northwest corner of sec. 2, T. 3 N., R. 16 W.; latitude—34 degrees, 45 minutes, 52 seconds N.; longitude—98 degrees, 51 minutes, 6 seconds W.; USGS quadrangle—Cooperton

Characteristics of Brico and Similar Soils

Composition: 30 percent

Geomorphic setting: Mountains

Position on landform: Mountain flanks and bases

Parent material: Clayey colluvium derived from granite

Slope: 8 to 20 percent

Runoff class: High

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately slow

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Well drained

Available water capacity: About 6.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 7s

Ecological site ID and name: 082BY004OK, Boulder Ridge

Soil Survey of Jackson County, Oklahoma

Typical profile:

- A—0 to 11 inches; cobbly loam
- Bt1—11 to 24 inches; cobbly clay
- Bt2—24 to 40 inches; cobbly clay loam
- BC—40 to 72 inches; cobbly clay loam

Location of typical profile: 600 feet south and 50 feet east of the northwest corner of sec. 11, T. 3 N., R. 16 W.; latitude—34 degrees, 45 minutes, 10 seconds N.; longitude—98 degrees, 51 minutes, 39 seconds W.; USGS quadrangle—Cooperton

Additional Components

Lawton and similar soils: 10 percent

Management

Major uses: Wildlife habitat and recreation

For information about managing this map unit, see the following sections of this publication:

- "Rangeland"
- "Crops and Pasture"
- "Recreation"
- "Engineering" and "Soil Properties"

RKO—Rock outcrop, granite

Map Unit Setting

MLRA: 82B

General location in the county: Part of the Wichita Mountains

Elevation: 1,000 to 2,500 feet

Mean annual precipitation: 25 to 30 inches

Mean annual air temperature: 61 to 63 degrees F

Frost-free period: 200 to 220 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Rock Outcrop

Composition: 100 percent

Geomorphic setting: Mountains

Position on landform: Mountaintops and mountain flanks

Kind of rock: Granite

Slope: 20 to 45 percent

Runoff class: Very high

Depth to lithic bedrock: 0 inches

Slowest permeability class within a depth of 80 inches: Impermeable

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 8s

Ecological site ID and name: None assigned

Location of typical area: 900 feet south and 2,400 feet west of the northeast corner of sec. 35, T. 4 N., R. 16 W.; latitude—34 degrees, 46 minutes, 51 seconds N.;

Soil Survey of Jackson County, Oklahoma

longitude—98 degrees, 51 minutes, 5 seconds W.; USGS quadrangle—Cooperton

Management

Major uses: Wildlife habitat and recreation

RuuA—Rups silty clay loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 250 acres

Characteristics of Rups and Similar Soils

Composition: 90 percent

Geomorphic setting: Flood plains

Parent material: Silty and clayey alluvium

Slope: 0 to 1 percent

Runoff class: Very high

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Slow

Drainage class: Somewhat poorly drained

Available water capacity: About 6.8 inches

Depth to the top of the seasonal high water table: 1.5 to 3.5 feet

Flooding: Occasional

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 4s

Ecological site ID and name: R078XY046OK, Saline Bottomland

Typical profile:

Ap—0 to 7 inches; silty clay loam

Bk—7 to 21 inches; silty clay loam

Bkyz—21 to 43 inches; silty clay loam

Ckyz—43 to 80 inches; stratified silty clay loam

Location of typical profile: 325 feet south and 275 feet west of the northeast corner of sec. 26, T. 4 N., R. 21 W.; latitude—34 degrees, 47 minutes, 50 seconds N.; longitude—99 degrees, 22 minutes, 16 seconds W.; USGS quadrangle—Blair

Additional Components

Spur and similar soils: 7 percent

Beckman and similar soils: 3 percent

Management

Major uses: Pasture and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

RuwA—Rups silty clay loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Long and narrow, 10 to 100 acres

Characteristics of Rups and Similar Soils

Composition: 82 percent

Geomorphic setting: Flood plains

Parent material: Silty and clayey alluvium

Slope: 0 to 1 percent

Runoff class: Very high

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Slow

Drainage class: Somewhat poorly drained

Available water capacity: About 7.1 inches

Depth to the top of the seasonal high water table: 1.5 to 3.5 feet

Flooding: Frequent

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 5w

Ecological site ID and name: R078XY046OK, Saline Bottomland

Typical profile:

A—0 to 15 inches; silty clay loam

Bkz—15 to 48 inches; clay loam

Ckz—48 to 80 inches; stratified clay loam to silty clay loam

Location of typical profile: 300 feet south and 2,450 feet east of the northwest corner of sec. 14, T. 1 N., R. 20 W.; latitude—34 degrees, 33 minutes, 52 seconds N.; longitude—99 degrees, 16 minutes, 23 seconds W.; USGS quadrangle—Altus SE

Additional Components

Spur and similar soils: 10 percent

Retrop and similar soils: 5 percent
Beckman and similar soils: 3 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

SkCC2—Spikebox-Cobb complex, 3 to 5 percent slopes, eroded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 5 to 100 acres

Note: This map unit has undergone moderate erosion because of cultivation. The forage production and species composition of native grasses that have been reseeded can vary widely from site to site because of the degree of erosion and the seed source of grasses that have been planted. For information about the original native vegetation, refer to the ecological site data for map unit Cobb (Cobb fine sandy loam, 1 to 3 percent slopes).

Characteristics of Spikebox and Similar Soils

Composition: 50 percent

Geomorphic setting: Hills on uplands

Position on landform: Side slopes

Parent material: Loamy residuum weathered from sandstone

Slope: 3 to 5 percent

Runoff class: Medium

Depth to paralithic bedrock: 8 to 20 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Well drained

Available water capacity: About 1.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6s

Ecological site ID and name: R078XY834OK, Reseeded Sandy Land

Typical profile:

Ap—0 to 6 inches; fine sandy loam
BC—6 to 13 inches; fine sandy loam
Cr—13 to 40 inches; bedrock

Location of typical profile: 2,350 feet south and 2,300 feet east of the northwest corner of sec. 31, T. 1 N., R. 20 W.; latitude—34 degrees, 30 minutes, 54 seconds N.; longitude—99 degrees, 20 minutes, 36 seconds W.; USGS quadrangle—Altus SE

Characteristics of Cobb and Similar Soils

Composition: 45 percent

Geomorphic setting: Hills on uplands

Position on landform: Side slopes

Parent material: Loamy residuum weathered from sandstone

Slope: 3 to 5 percent

Runoff class: Low

Depth to paralithic bedrock: 20 to 40 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderately slow

Drainage class: Well drained

Available water capacity: About 5.8 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078XY834OK, Reseeded Sandy Land

Typical profile:

Ap—0 to 7 inches; fine sandy loam
Bt—7 to 28 inches; sandy clay loam
BC—28 to 39 inches; fine sandy loam
Cr—39 to 80 inches; bedrock

Location of typical profile: 2,500 feet south and 2,450 feet east of the northwest corner of sec. 31, T. 1 N., R. 20 W.; latitude—34 degrees, 30 minutes, 53 seconds N.; longitude—99 degrees, 20 minutes, 34 seconds W.; USGS quadrangle—Altus SE

Additional Components

Vernon and similar soils: 5 percent

Management

Major uses: Cropland and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

SpDB—Springer and Devol loamy sands, 0 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the northeastern and southwestern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Springer and Similar Soils

Composition: 70 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Interdune areas

Parent material: Coarse-loamy eolian sands over loamy alluvium

Slope: 0 to 3 percent

Runoff class: Very low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 5.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY082TX, Loamy Sand Prairie PE 31-44

Typical profile:

Ap—0 to 13 inches; loamy sand

Bt—13 to 42 inches; fine sandy loam

BC—42 to 57 inches; fine sand

Btb—57 to 80 inches; fine sandy loam

Location of typical profile: 760 feet south and 1,900 feet west of the northeast corner of sec. 3, T. 7 N., R. 22 W.; latitude—35 degrees, 6 minutes, 52 seconds N.; longitude—99 degrees, 30 minutes, 26 seconds W.; USGS quadrangle—Willow

Characteristics of Devol and Similar Soils

Composition: 22 percent

Geomorphic setting: Sand sheets on alluvial plains

Position on landform: Interdune areas

Parent material: Coarse-loamy eolian sands

Slope: 0 to 3 percent

Runoff class: Very low

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Well drained

Soil Survey of Jackson County, Oklahoma

Available water capacity: About 5.8 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY105TX, Loamy Sand Prairie PE 31-44

Typical profile:

Ap—0 to 14 inches; loamy sand

Bt1—14 to 29 inches; fine sandy loam

Bt2—29 to 45 inches; fine sandy loam

BC—45 to 65 inches; loamy sand

C—65 to 80 inches; fine sand

Location of typical profile: 100 feet north and 1,950 feet east of the southwest corner of sec. 24, T. 7 N., R. 22 W.; latitude—35 degrees, 3 minutes, 33 seconds N.; longitude—99 degrees, 28 minutes, 21 seconds W.; USGS quadrangle—Lake Creek

Additional Components

Grandfield and similar soils: 5 percent

Eda and similar soils: 3 percent

Management

Major uses: Cropland and pasture

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

SurA—Spur clay loam, 0 to 1 percent slopes, rarely flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 500 acres

Characteristics of Spur and Similar Soils

Composition: 70 percent

Geomorphic setting: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Soil Survey of Jackson County, Oklahoma

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 10.0 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: Rare

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2c

Ecological site ID and name: R078CY050OK, Loamy Bottomland

Typical profile:

Ap—0 to 14 inches; clay loam

Bw1—14 to 30 inches; clay loam

Bw2—30 to 51 inches; clay loam

C—51 to 80 inches; stratified fine sandy loam to clay loam

Location of typical profile: 1,600 feet south and 1,600 feet east of the northwest corner of sec. 25, T. 2 N., R. 22 W.; latitude—34 degrees, 37 minutes, 8 seconds N.; longitude—99 degrees, 28 minutes, 6 seconds W.; USGS quadrangle—Olustee

Additional Components

Gageby and similar soils: 14 percent

Clearfork and similar soils: 8 percent

Westola and similar soils: 8 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

SuuA—Spur clay loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 250 acres

Characteristics of Spur and Similar Soils

Composition: 90 percent

Geomorphic setting: Flood plains

Parent material: Loamy alluvium

Soil Survey of Jackson County, Oklahoma

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 10.0 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: Occasional

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2w

Ecological site ID and name: R078CY050OK, Loamy Bottomland

Typical profile:

Ap—0 to 10 inches; clay loam

A—10 to 16 inches; loam

Bk—16 to 48 inches; clay loam

Cy—48 to 80 inches; clay loam

Location of typical profile: 200 feet south and 2,100 feet west of the northeast corner of sec. 19, T. 1 S., R. 21 W.; latitude—34 degrees, 27 minutes, 49 seconds N.; longitude—99 degrees, 26 minutes, 12 seconds W.; USGS quadrangle—Ayers Island

Additional Components

Westola and similar soils: 6 percent

Clairemont and similar soils: 2 percent

Rups and similar soils: 2 percent

Management

Major uses: Cropland and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

SuwA—Spur clay loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Long and narrow, 10 to 100 acres

Characteristics of Spur and Similar Soils

Composition: 85 percent

Geomorphic setting: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 10.0 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: Frequent

Ponding: None

Interpretive groups

Land capability (nonirrigated): 5w

Ecological site ID and name: R078BY080TX, Loamy Bottomland PE 25-36

Typical profile:

Ap—0 to 8 inches; clay loam

Bw1—8 to 17 inches; clay loam

Bw2—17 to 35 inches; clay loam

Bk—35 to 49 inches; sandy clay loam

C—49 to 80 inches; stratified fine sandy loam to clay loam

Location of typical profile: 1,800 feet south and 400 feet west of the northeast corner of sec. 15, T. 1 S., R. 24 W.; latitude—34 degrees, 28 minutes, 27 seconds N.; longitude—99 degrees, 41 minutes, 31 seconds W.; USGS quadrangle—Eldorado

Additional Components

Clairemont and similar soils: 5 percent

Rups and similar soils: 5 percent

Westola and similar soils: 5 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

TARD—Talpa-Aspermont-Rock outcrop complex, 1 to 8 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Soil Survey of Jackson County, Oklahoma

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Talpa and Similar Soils

Composition: 46 percent

Geomorphic setting: Hills on karstland

Position on landform: Interfluves and side slopes

Parent material: Loamy residuum weathered from dolostone

Slope: 1 to 8 percent

Runoff class: Very high

Depth to lithic bedrock: 4 to 20 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderate

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 1.1 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 7s

Ecological site ID and name: R078BY091TX, Very Shallow PE 25-36

Typical profile:

A—0 to 7 inches; loam

R—7 to 40 inches; bedrock

Location of typical profile: 2,275 feet south and 2,150 feet west of the northeast corner of sec. 3, T. 2 N., R. 22 W.; latitude—34 degrees, 40 minutes, 30 seconds N.; longitude—99 degrees, 29 minutes, 55 seconds W.; USGS quadrangle—Martha

Characteristics of Aspermont and Similar Soils

Composition: 37 percent

Geomorphic setting: Hills on karstland

Position on landform: Interfluves and side slopes

Parent material: Fine-silty colluvium over silty and clayey residuum weathered from shale and siltstone

Slope: 1 to 5 percent

Runoff class: Medium

Depth to densic bedrock: 40 to 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Moderately slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 7.5 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site ID and name: R078BY079TX, Loamy PE 25-36

Typical profile:

A—0 to 10 inches; silt loam
Bk—10 to 42 inches; silty clay loam
Cd—42 to 80 inches; silty clay

Location of typical profile: 2,200 feet south and 2,100 feet west of the northeast corner of sec. 3, T. 2 N., R. 22 W.; latitude—34 degrees, 40 minutes, 31 seconds N.; longitude—99 degrees, 29 minutes, 54 seconds W.; USGS quadrangle—Martha

Characteristics of Rock Outcrop

Composition: 11 percent
Geomorphic setting: Hills on karstland
Position on landform: Interfluvies and side slopes
Kind of rock: Dolostone
Slope: 1 to 8 percent
Runoff class: Very high
Depth to lithic bedrock: 0 to 3 inches
Slowest permeability class within a depth of 80 inches: Impermeable
Depth to the top of the seasonal high water table: More than 6.0 feet
Flooding: None
Ponding: None

Interpretive groups

Land capability (nonirrigated): 8s
Ecological site ID and name: None assigned

Location of typical area: 2,400 feet south and 2,200 feet west of the northeast corner of sec. 3, T. 2 N., R. 22 W.; latitude—34 degrees, 40 minutes, 28 seconds N.; longitude—99 degrees, 29 minutes, 56 seconds W.; USGS quadrangle—Martha

Additional Components

Nipsum and similar soils: 4 percent
Cottonwood and similar soils: 2 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

TilA—Tillman clay loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C
General location in the county: Mainly the central and eastern parts
Elevation: 1,000 to 1,500 feet
Mean annual precipitation: 25 to 28 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 230 days
Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Tillman and Similar Soils

Composition: 85 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Runoff class: Medium

Depth to densic bedrock: 80 to 120 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Well drained

Available water capacity: About 8.6 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2s

Ecological site ID and name: R078CY096TX, Clay Loam PE 31-44

Typical profile:

Ap—0 to 8 inches; clay loam

Bt—8 to 15 inches; clay loam

Btk1—15 to 45 inches; clay

Btk2—45 to 62 inches; clay

2BC—62 to 78 inches; clay

2C—78 to 90 inches; silty clay

2Cd—90 to 100 inches; silty clay

Location of typical profile: 1,900 feet north and 2,100 feet east of the southwest corner of sec. 26, T. 2 N., R. 20 W.; latitude—34 degrees, 36 minutes, 50 seconds N.; longitude—99 degrees, 16 minutes, 27 seconds W.; USGS quadrangle—Altus SE

Additional Components

Hollister and similar soils: 12 percent

Tilvern and similar soils: 3 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

TilB—Tillman clay loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 1,500 feet

Soil Survey of Jackson County, Oklahoma

Mean annual precipitation: 25 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 600 acres

Characteristics of Tillman and Similar Soils

Composition: 84 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Clayey alluvium

Slope: 1 to 3 percent

Runoff class: High

Depth to densic bedrock: 80 to 120 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Slow

Slowest permeability class within a depth of 80 inches: Slow

Drainage class: Well drained

Available water capacity: About 8.6 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY096TX, Clay Loam PE 31-44

Typical profile:

Ap—0 to 6 inches; clay loam

Bt1—6 to 10 inches; clay loam

Bt2—10 to 25 inches; clay

Btk1—25 to 48 inches; clay

Btk2—48 to 60 inches; clay

BCk—60 to 82 inches; clay

2C—82 to 90 inches; silty clay

2Cd—90 to 100 inches; silty clay

Location of typical profile: 700 feet north and 100 feet east of the southwest corner of sec. 4, T. 1 N., R. 20 W.; latitude—34 degrees, 34 minutes, 54 seconds N.; longitude—99 degrees, 18 minutes, 56 seconds W.; USGS quadrangle—Altus SE

Additional Components

Hollister and similar soils: 8 percent

Tilvern and similar soils: 4 percent

Vernon and similar soils: 4 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

TipA—Tipton loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts, but also the southwestern part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Tipton and Similar Soils

Composition: 73 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 10.4 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Note: This map unit has areas where the mollic epipedon is thinner than is defined as the range for the Tipton series. This difference does not significantly affect the use and management of the soil.

Interpretive groups

Land capability (nonirrigated): 2c

Ecological site ID and name: R078CY056OK, Loamy Prairie

Typical profile:

Ap—0 to 8 inches; loam

A—8 to 15 inches; loam

Bt—15 to 25 inches; clay loam

Btk—25 to 41 inches; clay loam

Bk—41 to 66 inches; clay loam

C—66 to 80 inches; loam

Location of typical profile: 1,000 feet south and 450 feet west of the northeast corner of sec. 24, T. 1 S., R. 20 W.; latitude—34 degrees, 27 minutes, 42 seconds N.; longitude—99 degrees, 14 minutes, 18 seconds W.; USGS quadrangle—White Lake

Additional Components

Roark and similar soils: 12 percent

Ozark and similar soils: 10 percent

Devol and similar soils: 5 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

TlvB—Tilvern clay loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Throughout the county

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Tilvern and Similar Soils

Composition: 78 percent

Geomorphic setting: Hills on uplands

Position on landform: Interfluves and base slopes

Parent material: Clayey shale residuum

Slope: 1 to 3 percent

Runoff class: Very high

Depth to densic bedrock: 40 to 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Very slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 6.6 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078BY090TX, Clay Prairie PE 25-36

Typical profile:

Ap—0 to 5 inches; clay loam

Bk—5 to 11 inches; silty clay

Bkss—11 to 31 inches; silty clay

Bky—31 to 44 inches; silty clay

BCky—44 to 51 inches; silty clay

Cd—51 to 80 inches; silty clay

Location of typical profile: 1,200 feet north and 2,200 feet east of the southwest corner of sec. 24, T. 1 N., R. 23 W.; latitude—34 degrees, 32 minutes, 21 seconds N.; longitude—99 degrees, 34 minutes, 19 seconds W.; USGS quadrangle—Prairie Hill

Additional Components

Westill and similar soils: 12 percent
Vernon and similar soils: 10 percent

Management

Major uses: Cropland and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"
"Crops and Pasture"
"Recreation"
"Engineering" and "Soil Properties"

TpfA—Tipton fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts, but also the southwestern part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Tipton and Similar Soils

Composition: 90 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 9.9 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY056OK, Loamy Prairie

Typical profile:

Ap—0 to 7 inches; fine sandy loam

A—7 to 13 inches; fine sandy loam

BA—13 to 24 inches; loam

Bt—24 to 47 inches; clay loam

Btk—47 to 63 inches; sandy clay loam

BCK—63 to 80 inches; sandy loam

Soil Survey of Jackson County, Oklahoma

Location of typical profile: 450 feet south and 600 feet east of the northwest corner of sec. 9, T. 3 N., R. 21 W.; latitude—34 degrees, 45 minutes, 11 seconds N.; longitude—99 degrees, 25 minutes, 15 seconds W.; USGS quadrangle—Hester

Additional Components

Roark and similar soils: 7 percent

Grandfield and similar soils: 3 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

TrwB—Treadway silty clay loam, 0 to 2 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Treadway and Similar Soils

Composition: 87 percent

Geomorphic setting: Pediments on uplands

Position on landform: Alluvial fans

Parent material: Silty and clayey alluvium derived from shale

Slope: 0 to 2 percent

Runoff class: Very high

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Very slow

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Well drained

Available water capacity: About 7.3 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Salinity: Saline within a depth of 30 inches

Interpretive groups

Land capability (nonirrigated): 6s

Ecological site ID and name: R078CY064OK, Clay Flats

Typical profile:

Ap—0 to 7 inches; silty clay loam

Bkyz1—7 to 20 inches; silty clay loam

Bkyz2—20 to 64 inches; silty clay loam

C—64 to 80 inches; silty clay loam

Location of typical profile: 200 feet north and 2,200 feet east of the southwest corner of sec. 31, T. 1 N., R. 19 W.; latitude—34 degrees, 14 minutes, 18 seconds N.; longitude—99 degrees, 30 minutes, 28 seconds W.; USGS quadrangle—Tipton

Additional Components

Vernon and similar soils: 5 percent

Westill and similar soils: 5 percent

Mangum and similar soils: 3 percent

Management

Major uses: Cropland and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

UST—Ustorthents, 5 to 40 percent slopes, very stony

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Ustorthents

Composition: 100 percent

Geomorphic setting: Spoil piles

Parent material: Silty and clayey mine spoil or earthy fill derived from shale

Slope: 5 to 40 percent

Runoff class: Very high

Depth: More than 60 inches

Slowest permeability class within a depth of 80 inches: Very slow

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 7s

Ecological site ID and name: None assigned

Location of typical area: 500 feet north and 500 feet east of the southwest corner of sec. 10, T. 1 S., R. 22 W.; latitude—34 degrees, 28 minutes, 48 seconds N.; longitude—99 degrees, 29 minutes, 51 seconds W.; USGS quadrangle—Ayers Island

Management

Major use: Wildlife habitat

VeKE—Vernon-Knoco complex, 1 to 12 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the central and eastern parts, but also the western edge of the county

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Vernon and Similar Soils

Composition: 40 percent

Geomorphic setting: Hills on uplands

Position on landform: Side slopes

Parent material: Clayey shale residuum

Slope: 1 to 12 percent

Runoff class: Very high

Depth to densic bedrock: 20 to 40 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 3.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6e

Ecological site ID and name: R078BY090TX, Clay Prairie PE 25-36

Typical profile:

A—0 to 6 inches; clay loam

Bk—6 to 26 inches; clay

Cd—26 to 80 inches; clay

Location of typical profile: 750 feet north and 600 feet west of the southeast corner of sec. 20, T. 3 N., R. 23 W.; latitude—34 degrees, 42 minutes, 44 seconds N.; longitude—99 degrees, 38 minutes, 2 seconds W.; USGS quadrangle—McQueen

Characteristics of Knoco and Similar Soils

Composition: 35 percent

Geomorphic setting: Hills on uplands

Position on landform: Side slopes

Parent material: Residuum weathered from clayey shale

Slope: 1 to 12 percent

Runoff class: Very high

Depth to densic bedrock: 3 to 20 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Soil Survey of Jackson County, Oklahoma

Available water capacity: About 1.4 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6s

Ecological site ID and name: R078BY092TX, Very Shallow Clay PE 25-36

Typical profile:

A—0 to 6 inches; silty clay

C—6 to 16 inches; clay

Cd—16 to 60 inches; clay

Location of typical profile: 250 feet north and 600 feet west of the southeast corner of sec. 20, T. 3 N., R. 23 W.; latitude—34 degrees, 42 minutes, 39 seconds N.; longitude—99 degrees, 38 minutes, 2 seconds W.; USGS quadrangle—McQueen

Additional Components

Badland: 10 percent

Tilvern and similar soils: 10 percent

Cottonwood and similar soils: 3 percent

Rock outcrop: 2 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

VerC—Vernon clay loam, 3 to 5 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 5 to 100 acres

Characteristics of Vernon and Similar Soils

Composition: 64 percent

Geomorphic setting: Hills on uplands

Position on landform: Side slopes

Parent material: Clayey shale residuum

Slope: 3 to 5 percent

Runoff class: Very high

Depth to densic bedrock: 20 to 40 inches

Soil Survey of Jackson County, Oklahoma

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:

Very slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 5.0 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078BY090TX, Clay Prairie PE 25-36

Typical profile:

Ap—0 to 6 inches; clay loam

Bk—6 to 26 inches; clay

BCK—26 to 35 inches; clay

Cd—35 to 80 inches; clay

Location of typical profile: 1,100 feet north and 2,100 feet west of the southeast corner of sec. 20, T. 1 S., R. 22 W.; latitude—34 degrees, 31 minutes, 11 seconds N.; longitude—99 degrees, 31 minutes, 27 seconds W.; USGS quadrangle—Quanah NE

Additional Components

Tilvern and similar soils: 12 percent

Westill and similar soils: 12 percent

Knoco and similar soils: 8 percent

Burford and similar soils: 4 percent

Management

Major uses: Pasture and rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

VeTE—Vernon-Talpa complex, 1 to 12 percent slopes, stony

Map Unit Setting (fig. 24)

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 20 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 2,000 acres

Characteristics of Vernon and Similar Soils

Composition: 46 percent

Geomorphic setting: Hills on uplands



Figure 24.—An area of Vernon-Talpa complex, 1 to 12 percent slopes, stony.

Position on landform: Side slopes

Parent material: Clayey shale residuum

Slope: 1 to 12 percent

Runoff class: Very high

Depth to densic bedrock: 20 to 40 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 4.6 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 6e

Ecological site ID and name: R078BY090TX, Clay Prairie PE 25-36

Typical profile:

A—0 to 7 inches; clay loam

Bk1—7 to 16 inches; clay

Bk2—16 to 25 inches; clay

Ck—25 to 38 inches; clay

Cd—38 to 80 inches; clay

Location of typical profile: 250 feet north and 2,100 feet east of the southwest corner of sec. 34, T. 2 N., R. 23 W.; latitude—34 degrees, 35 minutes, 42 seconds N.; longitude—99 degrees, 30 minutes, 7 seconds W.; USGS quadrangle—Prairie Hill

Characteristics of Talpa and Similar Soils

Composition: 25 percent

Geomorphic setting: Hills on uplands

Position on landform: Side slopes

Parent material: Loamy residuum weathered from dolostone

Slope: 1 to 12 percent

Runoff class: Very high

Depth to lithic bedrock: 4 to 20 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 1.4 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 7s

Ecological site ID and name: R078BY091TX, Very Shallow PE 25-36

Typical profile:

A—0 to 9 inches; loam

R—9 to 40 inches; bedrock

Location of typical profile: 400 feet north and 2,350 feet east of the southwest corner of sec. 34, T. 2 N., R. 23 W.; latitude—34 degrees, 35 minutes, 43 seconds N.; longitude—99 degrees, 30 minutes, 4 seconds W.; USGS quadrangle—Prairie Hill

Additional Components

Aspermont and similar soils: 10 percent

Knoco and similar soils: 10 percent

Tilvern and similar soils: 7 percent

Rock outcrop: 2 percent

Management

Major use: Rangeland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

W—Water

Map Unit Setting

MLRA: 78C

General location in the county: Throughout the county

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Characteristics of Water

Composition: 100 percent

Interpretive groups

Land capability (nonirrigated): None assigned

Ecological site ID and name: None assigned

Location of typical area: 1,000 feet north and 2,500 feet west of the southeast corner of sec. 8, T. 2 N., R. 20 W.; latitude—34 degrees, 39 minutes, 18 seconds N.; longitude—99 degrees, 19 minutes, 28 seconds W.; USGS quadrangle—Altus

Management

Major use: Recreation

WodB—Woods clay loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78C

General location in the county: North-central and central parts

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 22 to 24 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 220 days

Shape and size of areas: Irregular, 20 to 600 acres

Note: Areas of this map unit have slightly higher rainfall than is typical for the Woods series. These areas are considered to be isolated remnants of MLRA 77E.

Characteristics of Woods and Similar Soils

Composition: 95 percent

Geomorphic setting: Knolls on alluvial plains

Position on landform: Interfluves and side slopes

Parent material: Clayey alluvium and/or lacustrine deposits

Slope: 1 to 3 percent

Runoff class: Very high

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow

Slowest permeability class within a depth of 80 inches: Very slow

Drainage class: Well drained

Available water capacity: About 11.0 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078CY057OK, Limy Prairie

Typical profile:

Ap—0 to 8 inches; clay loam

Btss1—8 to 15 inches; clay

Btss2—15 to 33 inches; clay

Btk—33 to 49 inches; clay

Bk—49 to 64 inches; clay loam

Ck—64 to 80 inches; clay loam

Soil Survey of Jackson County, Oklahoma

Location of typical profile: 1,870 feet south and 300 feet east of the northwest corner of sec. 35, T. 4 N., R. 21 W.; latitude—34 degrees, 46 minutes, 43 seconds N.; longitude—99 degrees, 23 minutes, 11 seconds W.; USGS quadrangle—Hester

Additional Components

Mansic and similar soils: 5 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

- "Rangeland"
- "Crops and Pasture"
- "Recreation"
- "Engineering" and "Soil Properties"

WslA—Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly the central and eastern parts

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 250 acres

Characteristics of Westola and Similar Soils

Composition: 90 percent

Geomorphic setting: Flood plains in river valleys

Parent material: Coarse-loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderately rapid

Slowest permeability class within a depth of 80 inches: Moderately rapid

Drainage class: Well drained

Available water capacity: About 8.4 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: Occasional

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2w

Ecological site ID and name: R078CY050OK, Loamy Bottomland

Typical profile:

A—0 to 12 inches; fine sandy loam

C1—12 to 50 inches; stratified fine sandy loam to loam

C2—50 to 80 inches; stratified sand to sandy loam

Soil Survey of Jackson County, Oklahoma

Location of typical profile: 1,200 feet north and 1,000 feet east of the southwest corner of sec. 15, T. 1 N., R. 21 W.; latitude—34 degrees, 33 minutes, 15 seconds N.; longitude—99 degrees, 24 minutes, 3 seconds W.; USGS quadrangle—Olustee

Additional Components

Lincoln and similar soils: 6 percent

Gracemont and similar soils: 4 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

WstA—Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded

Map Unit Setting

MLRA: 78C

General location in the county: Mainly along the North Fork, Salt Fork, and Prairie Dog Town Fork of the Red River

Elevation: 1,000 to 2,000 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 20 to 500 acres

Characteristics of Westola and Similar Soils

Composition: 92 percent

Geomorphic setting: Flood plains in river valleys

Parent material: Coarse-loamy alluvium

Slope: 0 to 1 percent

Runoff class: Negligible

Depth: More than 60 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Moderate

Slowest permeability class within a depth of 80 inches: Moderate

Drainage class: Well drained

Available water capacity: About 8.9 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: Rare

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2e

Ecological site ID and name: R078CY050OK, Loamy Bottomland

Typical profile:

Ap—0 to 8 inches; fine sandy loam

Soil Survey of Jackson County, Oklahoma

A—8 to 19 inches; loam

C1—19 to 30 inches; fine sandy loam

C2—30 to 80 inches; stratified fine sandy loam to loam

Location of typical profile: 2,500 feet south and 1,900 feet west of the northeast corner of sec. 4, T. 2 N., R. 21 W.; latitude—34 degrees, 40 minutes, 28 seconds N.; longitude—99 degrees, 24 minutes, 36 seconds W.; USGS quadrangle—Martha

Additional Components

Spur and similar soils: 5 percent

Lincoln and similar soils: 3 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

Wt1A—Westill clay loam, 0 to 1 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 22 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Westill and Similar Soils

Composition: 85 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Clayey alluvium over silty and clayey residuum weathered from shale

Slope: 0 to 1 percent

Runoff class: High

Depth to densic bedrock: 60 to 80 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 7.7 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Interpretive groups

Land capability (nonirrigated): 2s

Ecological site ID and name: R078BY072TX, Clay Loam PE 25-36

Typical profile:

Ap—0 to 5 inches; clay loam
Bt1—5 to 15 inches; clay
Bt2—15 to 24 inches; clay
Btk—24 to 55 inches; clay
2C—55 to 70 inches; silty clay
2Cd—70 to 80 inches; silty clay

Location of typical profile: 2,150 feet north and 150 feet west of the southeast corner of sec. 4, T. 2 N., R. 25 W.; latitude—34 degrees, 40 minutes, 25 seconds N.; longitude—99 degrees, 49 minutes, 29 seconds W.; USGS quadrangle—Gould

Additional Components

Hollister and similar soils: 12 percent

Tilvern and similar soils: 3 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

Wt1B—Westill clay loam, 1 to 3 percent slopes

Map Unit Setting

MLRA: 78B

General location in the county: Mainly the western part

Elevation: 1,400 to 2,000 feet

Mean annual precipitation: 22 to 26 inches

Mean annual air temperature: 60 to 64 degrees F

Frost-free period: 200 to 230 days

Shape and size of areas: Irregular, 10 to 300 acres

Characteristics of Westill and Similar Soils

Composition: 83 percent

Geomorphic setting: Terraces on alluvial plains

Position on landform: Treads

Parent material: Clayey alluvium over silty and clayey residuum weathered from shale

Slope: 1 to 3 percent

Runoff class: Very high

Depth to densic bedrock: 60 to 80 inches

Slowest permeability class of the soil to a depth of 60 inches or to a restrictive layer:
Very slow

Slowest permeability class within a depth of 80 inches: Impermeable

Drainage class: Well drained

Available water capacity: About 7.4 inches

Depth to the top of the seasonal high water table: More than 6.0 feet

Flooding: None

Ponding: None

Soil Survey of Jackson County, Oklahoma

Interpretive groups

Land capability (nonirrigated): 3e

Ecological site ID and name: R078BY072TX, Clay Loam PE 25-36

Typical profile:

Ap—0 to 9 inches; clay loam

Bt—9 to 16 inches; clay

Btk—16 to 47 inches; clay

2BCk—47 to 56 inches; clay

2C—56 to 68 inches; silty clay

2Cd—68 to 80 inches; silty clay

Location of typical profile: 350 feet north and 2,300 feet west of the southeast corner of sec. 23, T. 3 N., R. 23 W.; latitude—34 degrees, 42 minutes, 40 seconds N.; longitude—99 degrees, 35 minutes, 12 seconds W.; USGS quadrangle—Duke

Additional Components

Hollister and similar soils: 10 percent

Tilvern and similar soils: 5 percent

Vernon and similar soils: 2 percent

Management

Major use: Cropland

For information about managing this map unit, see the following sections of this publication:

"Rangeland"

"Crops and Pasture"

"Recreation"

"Engineering" and "Soil Properties"

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

The table "Engineering Index Properties" gives estimates of the engineering classifications and the range of index properties for the major layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the

other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

The table "Physical Properties of the Soils" shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. The estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. The estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $1/3$ - or $1/10$ -bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2

millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (Ksat) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (Ksat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $\frac{1}{3}$ - or $\frac{1}{10}$ -bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. The estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Physical Analyses of Selected Soils

The results of physical analyses of several typical pedons in the survey area are given in the table "Physical Analyses of Selected Soils." The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the National Soil Survey Laboratory, Lincoln, Nebraska.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (USDA, 1996).

Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).

Water retained—pressure extraction, percentage of oven-dry weight of less than 2 mm material; $\frac{1}{3}$ or $\frac{1}{10}$ bar (4B1), 15 bars (4B2).

Water-retention difference—between $\frac{1}{3}$ bar and 15 bars for whole soil (4C1).

Bulk density—of less than 2 mm material, saran-coated clods field moist (4A1a), $\frac{1}{3}$ bar (4A1d), oven-dry (4A1h).

Linear extensibility (COLE)—change in clod dimension based on whole soil (4D).

Chemical Properties

The table "Chemical Properties of the Soils" shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory

analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Chemical Analyses of Selected Soils

The results of chemical analyses of several typical pedons in the survey area are given in the table "Chemical Analyses of Selected Soils." The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the National Soil Survey Laboratory, Lincoln, Nebraska.

Most determinations were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (USDA, 1996).

Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c).

Total carbon—dry combustion, Leco SC-444 carbon analyzer (6A2e).

Extractable cations—ammonium acetate pH 7.0, atomic absorption; calcium (6N2e), magnesium (6O2d), sodium (6P2b), potassium (6Q2b).

Extractable acidity—barium chloride-triethanolamine IV (6H5a).

Cation-exchange capacity—ammonium acetate, pH 7.0, steam distillation (5A8b).

Cation-exchange capacity—sum of cations (5A3a).

Base saturation—ammonium acetate, pH 7.0 (5C1).

Base saturation—sum of cations, TEA, pH 8.2 (5C3).

Reaction (pH)—1:1 water dilution (8C1f).

Reaction (pH)—calcium chloride (8C1f).

Carbonate as calcium carbonate—(fraction less than 2 mm [80 mesh]) manometric (6E1g).

Exchangeable sodium percentage—ammonium acetate, pH 7.0 (5D2).

Electrical conductivity (salinity)—saturation extract (8A3a).

Water Features

The table “Water Features” gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table “Water Features” indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table “Water Features” indicates *surface water depth* and the *duration and frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare,

rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

The table "Soil Features" gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the

combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
AcmA: Acme-----	0-15	Loam	CL-ML, CL, ML	A-4, A-6	0	0	98-100	95-100	85-100	60-95	22-35	2-13
	15-20	Clay loam, silty clay loam, silt loam, loam	ML, CL	A-4, A-6	0	0	98-100	95-100	85-100	60-95	30-40	7-19
	20-40	Loam, silt loam, clay loam, silty clay loam	CL, ML	A-4, A-6	0	0	98-100	95-100	85-100	60-95	30-40	7-19
	40-80	Gypsiferous loam, gypsiferous clay loam, gypsiferous silt loam, gypsiferous silty clay loam, gypsiferous material	ML, CL-ML, CL	A-6, A-4	0	0	95-100	90-100	80-100	60-95	22-40	2-19
ArHF: Arnett-----	0-15	Sandy loam	ML, SC-SM, SM, CL-ML	A-4	0	0	85-97	80-95	50-80	25-60	14-26	NP-7
	15-40	Clay loam, sandy clay loam	CL, SC	A-4, A-6	0	0	85-97	80-95	60-95	30-80	25-40	7-18
	40-58	Gravelly sandy clay loam, sandy clay loam, clay loam, gravelly clay loam	SC, CL	A-4, A-6, A- 2-6, A-2-4	0	0-5	65-95	55-85	40-75	20-60	25-40	7-18
	58-80	Gravelly sandy loam, gravelly sandy clay loam, gravelly clay loam, sandy loam, sandy clay loam, clay loam	SM, CL-ML, SC, ML, CL	A-4, A-6, A- 2-6, A-2-4	0	0-5	65-95	55-85	40-75	20-60	14-40	NP-18

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
ArHF: Hardeman-----	0-7	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-2-4, A-4	0	0	93-100	85-100	75-96	30-60	14-25	NP-7
	7-40	Fine sandy loam, very fine sandy loam, loam	ML, CL-ML, SM, SC-SM	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	40-60	Fine sandy loam, very fine sandy loam, loam	SM, CL-ML, ML, SC-SM	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	60-80	Fine sandy loam, very fine sandy loam, loam, loamy fine sand	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	93-100	85-100	75-90	25-60	0-26	NP-7
ArnB: Arnett-----	0-7	Sandy loam	CL-ML, SM, SC-SM, ML	A-4	0	0	85-97	80-95	50-80	25-60	14-26	NP-7
	7-26	Sandy clay loam, clay loam, gravelly sandy clay loam, gravelly clay loam	SC, CL	A-4, A-6	0	0	85-97	80-95	60-95	30-80	25-40	7-18
	26-46	Sandy loam, sandy clay loam, clay loam, gravelly sandy loam, gravelly sandy clay loam, gravelly clay loam	ML, CL, CL- ML, SM, SC	A-2-4, A-2-6, A-4, A-6	0	0-5	65-95	55-85	40-75	20-60	14-40	NP-18
	46-80	Sandy loam, sandy clay loam, clay loam, stratified gravelly loamy sand to gravelly clay loam	CL, SW-SM, SM, SC, CL- ML, ML	A-2-4, A-2-6, A-4, A-6	0	0-5	60-95	50-85	30-85	8-70	0-40	NP-18

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
ArnC: Arnett-----	0-7	Sandy loam	CL-ML, SC-SM, ML, SM	A-4	0	0	85-97	80-95	50-80	25-60	14-26	NP-7
	7-17	Clay loam, sandy clay loam	CL, SC	A-4, A-6	0	0	85-97	80-95	60-95	30-80	25-40	7-18
	17-31	Gravelly sandy clay loam, sandy clay loam, clay loam, gravelly clay loam	SC, CL	A-4, A-6, A- 2-6, A-2-4	0	0-5	65-95	55-85	40-75	20-60	25-40	7-18
	31-44	Gravelly sandy loam, gravelly sandy clay loam, gravelly clay loam, sandy loam, sandy clay loam, clay loam	CL, ML, SC, SM, CL-ML, SC-SM	A-4, A-6, A- 2-6, A-2-4	0	0-5	65-95	55-85	40-75	20-60	14-40	NP-18
	44-80	Stratified gravelly loamy sand to gravelly clay loam, sandy loam, sandy clay loam, clay loam	SW-SM, CL-ML, SM, SC, ML, CL	A-4, A-2-4, A-6, A-2-6	0	0-5	60-95	50-85	30-85	8-70	0-40	NP-18
AsmB: Aspermont-----	0-6	Silt loam	CL	A-4, A-6	0	0	98-100	90-100	80-100	65-90	30-37	8-14
	6-34	Silty clay loam, clay loam, silt loam, loam	CL	A-6, A-7	0	0	98-100	90-100	85-100	65-98	30-43	8-20
	34-43	Silty clay loam, clay loam, silt loam, loam	CL	A-6, A-7	0	0	98-100	90-100	85-100	65-95	30-43	8-20
	43-50	Silty clay loam, clay loam, silt loam, loam	CL	A-6, A-7	0	0	95-100	90-100	85-100	65-95	30-50	8-26
	50-80	Silty clay, silty clay loam, clay loam, clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	65-100	30-60	12-38

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
AsmC: Aspermont-----	0-8	Silt loam	CL	A-4, A-6	0	0	98-100	90-100	80-100	65-90	30-37	8-14
	8-35	Silty clay loam, clay loam, silt loam, loam	CL	A-6, A-7	0	0	98-100	90-100	85-100	65-98	30-43	8-20
	35-50	Silty clay loam, silt loam, clay loam, loam	CL	A-6, A-7	0	0	98-100	90-100	85-100	65-95	30-43	8-20
	50-80	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	65-100	30-60	12-38
BekA: Beckman-----	0-11	Silty clay	CH, CL	A-7	0	0	100	100	96-100	90-95	45-60	19-34
	11-44	Clay, silty clay	CL, CH	A-7	0	0	95-100	95-100	95-100	90-95	45-60	19-34
	44-80	Silty clay, clay	CL, CH	A-7	0	0	95-100	95-100	95-100	90-95	45-60	19-34
BfdB: Burford-----	0-5	Loam	CL	A-4, A-6	0	0	98-100	96-100	80-100	65-95	30-37	8-14
	5-12	Clay loam, silt loam, silty clay loam, loam	CL	A-6, A-7	0	0	98-100	96-100	90-100	75-98	30-43	8-20
	12-30	Loam, clay loam, silty clay loam, silt loam	CL	A-6, A-7	0	0	98-100	96-100	90-100	75-98	30-43	8-20
	30-43	Clay, clay loam, silty clay loam, silty clay	CL, CH	A-6, A-7	0	0	98-100	96-100	90-100	70-95	33-53	12-34
	43-80	Clay loam, silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BfdC: Burford-----	0-6	Loam	CL	A-4, A-6	0	0	98-100	96-100	80-100	65-95	30-37	8-14
	6-24	Loam, silt loam, silty clay loam, clay loam	CL	A-7, A-6	0	0	98-100	96-100	90-100	75-98	30-43	8-20
	24-40	Silty clay, clay, clay loam, silty clay loam	CH, CL	A-6, A-7	0	0	98-100	96-100	90-100	70-95	33-53	12-34
	40-80	Clay loam, clay, silty clay loam, silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
CobB: Cobb-----	0-7	Fine sandy loam	SC, SC-SM, SM	A-2-4, A-4	0	0	90-100	90-100	75-98	30-50	17-25	3-8
	7-29	Fine sandy loam, sandy clay loam, clay loam	SC, CL, CL- ML, SC-SM	A-4, A-6	0	0	90-100	80-100	65-100	40-65	20-40	7-18
	29-34	Fine sandy loam, sandy clay loam, clay loam	CL-ML, SC-SM, SC, CL	A-4, A-6	0	0	90-100	80-100	65-100	40-65	17-40	3-18
	34-80	Bedrock	---	---	---	---	---	---	---	---	---	---
CVRD: Cottonwood-----	0-5	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	80-100	55-85	25-37	4-13
	5-8	Gypsiferous silt loam, gypsiferous silty clay loam, gypsiferous loam, gypsiferous clay loam	CL-ML, CL	A-4, A-6, A- 7, A-5	0	0	95-100	90-100	80-100	55-85	25-43	4-19
	8-20	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CVRD: Vinson-----	0-4	Silt loam	CL	A-4, A-6	0	0	100	100	96-100	65-97	30-37	8-14
	4-15	Silty clay loam, silt loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	30-43	8-20
	15-22	Silty clay loam, silt loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	30-43	8-20
	22-28	Bedrock	---	---	---	---	---	---	---	---	---	---
	28-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Bedrock	---	---	---	---	---	---	---	---	---	---
DAM: Dam-----	0-80	Variable	---	---	---	---	---	---	---	---	---	---
DcbB: Decobb-----	0-8	Very fine sandy loam	CL-ML, ML	A-4	0	0	90-100	90-100	80-100	30-75	16-25	3-8
	8-18	Fine sandy loam, very fine sandy loam, loam	SC, SC-SM, SM, CL-ML, ML	A-2-4, A-4	0	0	90-100	90-100	80-100	30-75	16-25	3-8
	18-50	Clay loam, loam, sandy clay loam	SC, CL	A-4, A-6	0	0	90-100	85-100	75-100	30-85	25-40	7-18
	50-63	Fine sandy loam, very fine sandy loam, sandy clay loam, loam	SC, CL, SC- SM, SM, CL- ML, ML	A-4, A-6	0	0	90-100	85-100	75-100	30-70	14-31	NP-11
	63-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
DeSD: Devol-----	0-8	Loamy sand	SM	A-2	0	0	98-100	98-100	85-100	15-35	0-14	NP
	8-28	Fine sandy loam	CL-ML, SC-SM, SM, ML	A-2, A-4	0	0	98-100	98-100	90-100	25-60	14-26	NP-7
	28-47	Fine sandy loam, loamy fine sand	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	47-62	Loamy sand, fine sand, fine sandy loam, loamy fine sand	SM, SC-SM	A-2, A-4	0	0	98-100	98-100	80-100	5-50	0-26	NP-7
	62-80	Loamy sand, loamy fine sand, fine sand, fine sandy loam	SM, SC-SM	A-2, A-4	0	0	98-100	98-100	50-100	5-50	0-26	NP-7
Springer-----	0-15	Loamy sand	SM, SP-SM	A-2-4	0	0	98-100	95-100	70-96	10-25	0-14	NP-4
	15-41	Fine sandy loam, sandy loam, loamy sand, loamy fine sand	ML, SM, SC- SM, CL-ML	A-4, A-2-4	0	0	98-100	95-100	75-99	11-60	14-26	NP-7
	41-52	Fine sand, loamy sand, loamy fine sand, sandy loam	SW-SM, SM	A-2-4, A-3	0	0	98-100	95-100	70-96	8-25	0-14	NP-4
	52-70	Fine sandy loam, sandy clay loam	CL-ML, CL, SM, SC-SM, ML, SC	A-2-4, A-4	0	0	98-100	95-100	75-99	11-60	14-30	2-10
	70-80	Loamy sand, loamy fine sand, fine sandy loam, fine sand	SP-SM, SM, SC-SM	A-2, A-4	0	0	98-100	95-100	50-99	5-50	0-26	NP-7

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EatA:												
Eastall-----	0-12	Silty clay	CH	A-7-6	0	0	100	100	95-100	85-98	55-76	33-50
	12-19	Clay, silty clay	CH	A-7-6	0	0	100	100	95-100	85-98	55-76	33-50
	19-56	Clay, silty clay	CH	A-7-6	0	0	100	98-100	90-100	80-95	55-76	33-50
	56-76	Clay, silty clay	CH	A-7-6	0	0	100	98-100	90-100	80-95	55-76	33-50
	76-95	Silty clay, clay loam, silty clay loam, clay	CL, CH	A-7-6	0	0	100	98-100	90-100	70-95	40-76	20-50
EdsB:												
Eda-----	0-11	Sand	SP-SM, SM	A-2, A-3	0	0	100	100	82-100	5-35	0-14	NP
	11-35	Sand, loamy sand, loamy fine sand, fine sand	SP-SM, SM	A-2, A-3	0	0	100	100	82-100	3-35	0-14	NP
	35-80	Loamy fine sand, loamy sand, sand	SP-SM, SM	A-2, A-3	0	0	100	100	82-100	5-35	0-14	NP
EdsD:												
Eda-----	0-13	Sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-100	5-35	0-14	NP
	13-50	Loamy fine sand, loamy sand, sand, fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-100	3-35	0-14	NP
	50-80	Loamy fine sand, loamy sand, sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-100	5-35	0-14	NP
EdsF:												
Eda-----	0-18	Sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-100	5-35	0-14	NP
	18-40	Loamy sand, sand, fine sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-100	3-35	0-14	NP
	40-80	Fine sand, loamy fine sand, loamy sand, sand	SM, SP-SM	A-2, A-3	0	0	100	100	82-100	3-35	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
FayB: Farry-----	0-10	Fine sandy loam	CL-ML, SM, SC-SM, ML	A-2-4, A-4	0	0	98-100	95-100	85-100	30-60	14-26	NP-7
	10-36	Sandy loam, loam, sandy clay loam	SC, CL	A-2-4, A-4, A-6	0	0	95-100	85-100	70-90	30-85	14-37	7-16
	36-50	Sandy clay loam, loam, sandy loam, loamy sand	SC-SM, CL-ML, SC, SM	A-2-4, A-4, A-6	0	0	95-100	85-100	60-90	15-60	0-37	NP-16
	50-80	Sandy loam, loamy sand, loam	SP-SM, SM, SC-SM, SC	A-2-4, A-4	0	0	90-100	80-100	50-80	10-50	0-29	NP-10
FraB: Frankirk-----	0-6	Loam	CL	A-4, A-6	0	0	98-100	96-100	85-95	55-75	30-35	9-13
	6-18	Clay, clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	98-100	96-100	90-100	65-80	35-60	14-34
	18-52	Clay, sandy clay, clay loam	CL	A-6, A-7-6	0	0	98-100	96-100	90-100	65-80	35-60	14-34
	52-65	Clay loam, sandy clay loam, loam	CL	A-6	0	0	95-100	90-100	85-98	55-75	25-40	7-18
	65-80	Loam, clay loam, sandy clay loam	CL	A-6	0	0	95-100	90-100	85-98	55-75	25-38	7-18
GdfB: Grandfield-----	0-15	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-4	0	0	100	98-100	94-100	36-60	14-26	NP-7
	15-32	Fine sandy loam, sandy clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	24-37	6-16
	32-49	Fine sandy loam, sandy clay loam	SM, ML, SC, CL-ML, SC- SM, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	20-37	3-16
	49-56	Fine sandy loam, sandy clay loam	CL, ML, SC, SM, CL-ML, SC-SM	A-4	0	0	100	98-100	90-100	36-60	14-30	NP-10
	56-80	Fine sandy loam, sandy clay loam, loamy sand	SC-SM, CL-ML, SM, SC, CL, ML	A-2, A-4	0	0	100	98-100	90-100	15-60	0-30	NP-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GfGB: Grandmore-----	0-7	Fine sandy loam	ML, SC-SM, CL-ML, SM	A-4	0	0	100	98-100	70-95	36-60	15-26	NP-7
	7-24	Fine sandy loam, sandy clay loam	SC-SM, CL, CL-ML, SC	A-4, A-6	0	0	100	98-100	85-100	36-65	24-37	6-16
	24-43	Fine sandy loam, sandy clay loam	CL, SC-SM, CL-ML, ML, SC, SM	A-6, A-4	0	0	100	98-100	85-100	36-65	20-37	3-16
	43-70	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	98-100	90-100	70-95	31-60	11-34
	70-80	Clay loam, clay, sandy clay loam	CL, CH	A-6, A-7	0	0	100	98-100	90-100	70-95	31-60	11-34
Grandfield-----	0-8	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	0	100	98-100	94-100	36-60	14-26	NP-7
	8-17	Fine sandy loam, sandy clay loam	SC, SC-SM, CL, CL-ML	A-4, A-6	0	0	100	98-100	90-100	36-65	24-37	6-16
	17-55	Fine sandy loam, sandy clay loam	SC, ML, CL, SC-SM, CL- ML, SM	A-4, A-6	0	0	100	98-100	90-100	36-65	20-37	3-16
	55-72	Fine sandy loam, sandy clay loam	CL, SC-SM, CL-ML, SM, SC, ML	A-4	0	0	100	98-100	90-100	36-60	14-30	NP-10
	72-80	Fine sandy loam, sandy clay loam, loamy sand	SM, SC-SM, CL, CL-ML, SC, ML	A-2, A-4	0	0	100	98-100	90-100	15-60	0-30	NP-10
GlGB: Grandmore-----	0-11	Loamy sand	SM	A-2	0	0	100	98-100	60-95	15-35	0-14	NP
	11-22	Fine sandy loam, sandy clay loam	CL, CL-ML, SC-SM, SC	A-4, A-6	0	0	100	98-100	85-100	36-65	24-37	6-16
	22-42	Fine sandy loam, sandy clay loam	CL, ML, CL- ML, SC-SM, SC, SM	A-4, A-6	0	0	100	98-100	85-100	36-65	20-37	3-16
	42-72	Clay loam, clay	CH, CL	A-6, A-7	0	0	100	98-100	90-100	70-95	31-60	11-34
	72-80	Clay loam, clay, sandy clay loam	CL, CH	A-6, A-7	0	0	100	98-100	90-100	70-95	31-60	11-34

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GlGB: Grandfield-----	0-8	Loamy sand	SM	A-2	0	0	100	98-100	90-100	15-35	0-14	NP
	8-28	Fine sandy loam, sandy clay loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0	0	100	98-100	90-100	36-65	24-37	6-16
	28-55	Fine sandy loam, sandy clay loam	SM, SC, ML, CL, SC-SM, CL-ML	A-4, A-6	0	0	100	98-100	90-100	36-65	20-37	3-16
	55-75	Fine sandy loam, sandy clay loam	SM, ML, CL- ML, SC-SM, CL, SC	A-4	0	0	100	98-100	90-100	36-60	14-30	NP-10
	75-80	Fine sandy loam, sandy clay loam, loamy sand	SM, CL-ML, SC-SM, ML, CL, SC	A-4, A-2	0	0	100	98-100	90-100	15-60	0-30	NP-10
GlsB: Grandfield-----	0-7	Loamy sand	SM	A-2	0	0	100	98-100	90-100	15-35	0-14	NP
	7-27	Fine sandy loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	98-100	90-100	36-65	24-37	6-16
	27-40	Fine sandy loam, sandy clay loam	CL, ML, SC, SM, CL-ML, SC-SM	A-4, A-6	0	0	100	98-100	90-100	36-65	20-37	3-16
	40-54	Fine sandy loam, sandy clay loam	CL, ML, SC, SM, CL-ML, SC-SM	A-4	0	0	100	98-100	90-100	36-60	14-30	NP-10
	54-80	Fine sandy loam, sandy clay loam, loamy sand	SM, CL, ML, SC, CL-ML, SC-SM	A-4, A-2	0	0	100	98-100	90-100	15-60	0-30	NP-10
GlsD: Grandfield-----	0-10	Loamy sand	SM	A-2	0	0	100	98-100	90-100	15-35	0-14	NP
	10-35	Fine sandy loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	98-100	90-100	36-65	24-37	6-16
	35-55	Fine sandy loam, sandy clay loam	CL, ML, SC, SM, CL-ML, SC-SM	A-4, A-6	0	0	100	98-100	90-100	36-65	20-37	3-16
	55-72	Fine sandy loam, sandy clay loam	ML, CL, SC, SM, CL-ML, SC-SM	A-4	0	0	100	98-100	90-100	36-60	14-30	NP-10
	72-80	Fine sandy loam, sandy clay loam, loamy sand	CL, ML, SC, SM, CL-ML, SC-SM	A-4, A-2	0	0	100	98-100	90-100	15-60	0-30	NP-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GmuA: Gracemont-----	0-6	Fine sandy loam	CL-ML, SM, SC-SM, ML	A-4	0	0	100	98-100	94-100	36-90	15-26	NP-7
	6-20	Loam, fine sandy loam, stratified fine sandy loam to loam	ML, CL-ML, SM, SC-SM	A-4	0	0	100	98-100	94-100	36-90	14-29	NP-7
	20-80	Sandy loam, fine sandy loam, loam, clay loam, loamy sand, stratified loamy sand to clay loam	CL-ML, CL, ML, SC-SM, SM	A-2-4, A-4, A-6	0	0	100	98-100	94-100	27-85	0-40	NP-18
GmwA: Gracemont-----	0-4	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-4	0	0	100	98-100	94-100	36-90	15-26	NP-7
	4-35	Fine sandy loam, loam, stratified fine sandy loam to loam	SM, CL-ML, SC-SM, ML	A-4	0	0	100	98-100	94-100	36-90	14-29	NP-7
	35-80	Loamy sand, fine sandy loam, loam, clay loam, stratified loamy sand to clay loam	SC-SM, SM, CL-ML, CL, ML	A-2-4, A-4, A-6	0	0	100	98-100	90-100	15-85	0-40	NP-18
GSEA: Gracemore-----	0-8	Loam	CL, CL-ML, ML	A-6, A-4	0	0	100	100	96-100	65-85	20-35	2-13
	8-72	Sand, fine sand, loamy fine sand	SP-SM, SM	A-2-4, A-3	0	0	90-100	85-100	82-100	3-35	0-0	NP
Ezell-----	0-8	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-85	22-35	2-13
	8-80	Stratified fine sand to loam	SM, SP-SM	A-2, A-3	0	0	90-100	85-100	82-100	3-35	0-0	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HdmA: Hardeman-----	0-16	Fine sandy loam	ML, CL-ML, SC-SM, SM	A-2-4, A-4	0	0	93-100	85-100	75-96	30-60	14-25	NP-7
	16-55	Fine sandy loam, very fine sandy loam, loam	SM, CL-ML, ML, SC-SM	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	55-72	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	72-80	Fine sandy loam, very fine sandy loam, loam, loamy fine sand	ML, CL-ML, SC-SM, SM	A-2-4, A-4	0	0	93-100	85-100	75-90	25-60	0-26	NP-7
HdmB: Hardeman-----	0-6	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-2-4, A-4	0	0	93-100	85-100	75-96	30-60	14-25	NP-7
	6-46	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	46-80	Fine sandy loam, very fine sandy loam, loam	CL-ML, SC-SM, SM, ML	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
HdmC: Hardeman-----	0-13	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-2-4, A-4	0	0	93-100	85-100	75-96	30-60	14-25	NP-7
	13-35	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	35-62	Fine sandy loam, very fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	62-80	Fine sandy loam, very fine sandy loam, loam, loamy fine sand	SC-SM, CL-ML, SM, ML	A-2-4, A-4	0	0	93-100	85-100	75-90	25-60	0-26	NP-7

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HdmE: Hardeman-----	0-12	Fine sandy loam	CL-ML, SC-SM, SM, ML	A-2-4, A-4	0	0	93-100	85-100	75-96	30-60	14-25	NP-7
	12-28	Fine sandy loam, very fine sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	28-60	Fine sandy loam, very fine sandy loam, loam	SM, ML, CL- ML, SC-SM	A-2-4, A-4	0	0	93-100	85-100	75-90	30-60	14-29	NP-7
	60-80	Fine sandy loam, very fine sandy loam, loam, loamy fine sand	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	93-100	85-100	75-90	25-60	0-26	NP-7
HeyB: Heatly-----	0-22	Sand	SM, SP-SM	A-2	0	0	100	98-100	60-90	5-35	0-10	NP-4
	22-43	Sandy clay loam	SC-SM, CL, SC	A-4, A-6	0	0	100	98-100	70-95	36-65	25-37	7-16
	43-62	Sandy loam, sandy clay loam	SC, CL-ML, CL, SC-SM	A-6, A-4	0	0	100	98-100	60-90	36-65	20-37	4-16
	62-72	Sandy loam, sandy clay loam	CL, SC, SC- SM, CL-ML, ML, SM	A-4	0	0	100	98-100	60-90	36-60	15-30	2-10
	72-80	Sandy loam, sandy clay loam	SM, SC, SC-SM	A-2, A-4	0	0	100	98-100	60-90	25-55	15-30	2-10
HkfA: Headrick-----	0-9	Fine sandy loam	CL-ML, SM, ML, SC-SM	A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	9-45	Sandy clay loam, fine sandy loam	ML, SM, SC, CL	A-4, A-6	0	0	100	98-100	85-100	36-65	20-37	3-16
	45-72	Clay loam, clay	CH, CL	A-6, A-7	0	0	98-100	95-100	90-100	70-95	31-60	11-34
	72-80	Sandy clay loam, clay loam, silty clay loam, silty clay, clay	CH, CL, SC	A-6, A-7	0	0	98-100	95-100	90-100	36-98	30-60	10-34

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HksA: Headrick-----	0-5	Loamy sand			0	0	100	98-100	60-95	15-35	0-14	NP
	5-32	Sandy clay loam, fine sandy loam	CL, SM, SC, ML	A-4, A-6	0	0	100	98-100	85-100	36-65	20-37	3-16
	32-66	Clay loam, clay	CH, CL	A-6, A-7	0	0	98-100	95-100	90-100	70-95	31-60	11-34
	66-80	Sandy clay loam, clay loam, silty clay loam, silty clay, clay	CL, CH, SC	A-6, A-7	0	0	98-100	95-100	90-100	36-98	30-60	10-34
HolA: Hollister-----	0-9	Silty clay loam	CL	A-6, A-7-6	0	0	100	95-100	90-100	75-95	35-50	17-30
	9-23	Silty clay, clay, silty clay loam, clay loam	CH, CL	A-7-6	0	0	98-100	96-100	90-100	75-96	41-60	20-35
	23-72	Silty clay, clay, silty clay loam, clay loam	CH, CL	A-7-6	0	0	98-100	96-100	90-100	75-96	41-60	20-35
	72-110	Clay loam, clay, silty clay loam, silty clay	CH, CL	A-7-6	0	0	98-100	96-100	85-99	75-96	41-55	20-32
	110-138	Silty clay loam, clay, clay loam, bedrock, silty clay	CL, CH	A-7-6	0	0	98-100	96-100	85-99	75-96	41-55	20-32
HrAC: Harmon-----	0-7	Gravelly silt loam	CL-ML, CL, ML	A-4, A-6	0	0-5	70-95	65-85	60-85	40-80	22-35	2-12
	7-16	Gravelly silt loam, very gravelly silt loam, extremely gravelly silt loam	GC, GM, ML, CL, GC-GM, CL-ML	A-2-4, A-4, A-6	---	0-5	20-70	10-65	9-65	7-60	22-35	2-12
	16-40	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HrAC:												
Aspermont-----	0-5	Silt loam	CL	A-4, A-6	0	0	98-100	90-100	80-100	65-90	30-37	8-14
	5-40	Silty clay loam, clay loam, loam, silt loam	CL	A-6, A-7	0	0	98-100	90-100	85-100	65-98	30-43	8-20
	40-50	Silty clay loam, clay loam, loam, silt loam	CL	A-6, A-7	0	0	98-100	90-100	85-100	65-95	30-50	8-26
	50-80	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	65-100	30-60	12-38
JesC:												
Jester-----	0-7	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP-3
	7-45	Loamy fine sand, fine sand, sand	SP-SM, SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP-3
	45-80	Loamy fine sand, fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP-3
JesF:												
Jester-----	0-8	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP-3
	8-80	Loamy fine sand, fine sand, sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	3-35	0-14	NP-3
KcRG:												
Knoco-----	0-3	Bouldery silty clay	CH, CL	A-6, A-7-6	2-5	5-10	90-100	85-100	85-100	80-98	30-60	12-38
	3-9	Silty clay, clay	CH, CL	A-6, A-7-6	0-2	0-2	90-100	85-100	75-100	70-100	30-60	12-38
	9-60	Clay, silty clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
Rock outcrop----	0-60	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
KoBE:												
Knoco-----	0-6	Silty clay	CH, CL	A-6, A-7-6	0	0-2	90-100	80-100	75-100	60-90	30-60	12-38
	6-16	Clay, silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	75-100	70-100	30-60	12-38
	16-60	Clay, silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
Badland-----	0-60	Bedrock	---	---	0	0	---	---	---	---	---	---
LacB:												
La Casa-----	0-6	Silty clay loam	CL	A-6	0	0	98-100	95-100	90-100	70-95	33-42	12-19
	6-12	Silty clay loam, silty clay, clay loam, clay	CL, CH	A-6, A-7-6	0	0	98-100	95-100	90-98	70-98	37-55	15-30
	12-34	Silty clay, silty clay loam, clay, clay loam	CH, CL	A-6, A-7-6	0	0	98-100	95-100	90-98	70-98	37-55	15-30
	34-64	Silty clay loam, silty clay, clay, clay loam	CH, CL	A-6, A-7-6	0	0	98-100	93-100	85-98	65-95	33-55	13-30
	64-81	Silty clay loam, clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0	0-5	90-100	75-100	70-97	60-90	33-55	13-30
	81-91	Silty clay loam, clay loam, silty clay, clay	CL, CH	A-7-6, A-6	0	0-5	70-100	50-100	50-97	50-90	33-55	13-32
LDF:												
Landfill-----	0-80	Variable	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LnuA: Lincoln-----	0-8	Loamy sand	SM	A-2-4	0	0	95-100	85-100	75-100	15-35	0-14	NP-4
	8-21	Fine sand, sand, loamy sand, stratified sand to loam	SM, SP-SM	A-2-4, A-3	0	0	95-100	85-100	82-100	3-35	0-14	NP-4
	21-80	Stratified sand to loam, sand, loamy sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	85-100	82-100	5-35	0-14	NP-4
LnWA: Lincoln-----	0-5	Loamy sand	SM	A-2-4	0	0	95-100	85-100	75-100	15-35	0-14	NP-4
	5-15	Loamy sand, sand, stratified sand to loam	SM, SP-SM	A-2-4, A-3	0	0	95-100	85-100	82-100	5-35	0-14	NP-4
	15-80	Stratified sand to loam, sand, loamy sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	85-100	82-100	5-35	0-14	NP-4
Westola-----	0-5	Fine sandy loam	CL-ML, SM, SC-SM, ML	A-4	0	0	100	95-100	90-100	36-60	15-26	NP-7
	5-30	Fine sandy loam, very fine sandy loam, loam, stratified fine sandy loam to loam	CL-ML, SM, ML, SC-SM	A-4	0	0	100	95-100	90-100	36-85	15-30	NP-8
	30-80	Stratified sand to sandy loam, stratified loamy fine sand to loam	ML, SM, CL- ML, SC-SM	A-2-4, A-4	0	0	100	95-100	90-100	15-85	10-30	NP-8
M-W: Water-----	0-80	Water	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MagA: Madge-----	0-8	Loam	CL, CL-ML, ML	A-4	0	0	100	100	96-100	65-85	22-32	2-11
	8-18	Loam	CL, CL-ML, ML	A-4	0	0	100	100	96-100	65-85	22-32	2-11
	18-26	Loam, clay loam	CL	A-4, A-6	0	0	100	100	90-100	40-90	25-40	7-18
	26-47	Loam, clay loam, sandy clay loam	CL, SC	A-4, A-6	0	0	100	100	90-100	40-90	25-40	7-18
	47-64	Loam, fine sandy loam	SC, ML, SM, SC-SM, CL- ML, CL	A-4, A-6	0	0	100	98-100	94-100	36-85	15-35	NP-11
	64-80	Loam, fine sandy loam, very fine sandy loam	ML, CL, SC- SM, CL-ML, SM, SC	A-4	0	0	100	98-100	94-100	36-85	15-32	NP-10
MagB: Madge-----	0-11	Loam	CL, ML, CL-ML	A-4	0	0	100	100	96-100	65-85	22-32	2-11
	11-15	Loam, clay loam	CL	A-6, A-4	0	0	100	100	90-100	40-90	25-40	7-18
	15-22	Loam, clay loam	CL	A-4, A-6	0	0	100	100	90-100	40-90	25-40	7-18
	22-42	Loam, clay loam, sandy clay loam	SC, CL	A-4, A-6	0	0	100	100	90-100	40-90	25-40	7-18
	42-70	Loam, clay loam, sandy clay loam	SC, CL	A-4, A-6	0	0	100	100	90-100	40-90	25-40	7-18
	70-80	Loam, fine sandy loam	ML, CL-ML, SC-SM, CL, SC, SM	A-6, A-4	0	0	100	98-100	94-100	36-85	15-35	NP-11
MngA: Mangum-----	0-7	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-100	30-50	12-25
	7-21	Clay loam, silty clay, clay, silty clay loam	CL, CH	A-7-6, A-6	0	0	100	100	95-100	90-100	35-60	15-35
	21-80	Clay loam, silty clay, silty clay loam, clay, stratified silty clay loam to clay	CL, CH	A-6, A-7-6	0	0	100	100	95-100	90-100	30-55	12-30

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
NipA: Nipsum-----	0-10	Silty clay loam	CL	A-7-6	0	0-2	98-100	90-100	90-100	80-95	37-50	15-25
	10-30	Silty clay, clay, silty clay loam	CL	A-7-6	0	0-2	98-100	90-100	90-100	80-95	37-55	15-30
	30-45	Silty clay loam, silty clay, clay	CL, CH	A-7-6	0	0	98-100	90-100	90-100	80-100	37-60	15-30
	45-80	Silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0	0	98-100	90-100	90-100	80-100	33-60	12-30
NOTCOM: Area not surveyed, access denied.												
OakA: Oakley-----	0-12	Loam	CL	A-4, A-6	0	0	98-100	90-100	80-95	55-80	25-35	7-13
	12-43	Sandy clay loam, clay loam, loam	SC-SM, SC, CL-ML, CL	A-6, A-4	0	0	95-100	75-98	65-95	30-80	25-40	7-18
	43-58	Clay loam, sandy clay loam, loam	SC-SM, SC, CL-ML, CL	A-6, A-4	0	0	95-100	75-98	65-95	30-80	25-40	7-18
	58-85	Sandy loam, loam, sandy clay loam, clay loam	CL, CL-ML, ML, SC, SC- SM, SM	A-4, A-6	0	0	80-100	75-98	50-95	25-75	15-40	2-18
	85-95	Gravelly sandy loam, loam, stratified gravelly loamy sand to clay loam	SC, SC-SM, SM, ML, CL- ML, CL	A-6, A-4	0	0	80-100	75-98	50-95	25-75	15-40	2-18
	95-100	Clay, silty clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	65-100	30-60	12-38

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
OakB: Oakley-----	0-7	Loam	CL	A-4, A-6	0	0	98-100	90-100	80-95	55-80	25-35	7-13
	7-41	Loam, sandy clay loam, clay loam	SC, CL-ML, SC-SM, CL	A-6, A-4	0	0	95-100	75-98	65-95	30-80	25-40	7-18
	41-49	Clay loam, sandy clay loam, loam	SC-SM, SC, CL-ML, CL	A-6, A-4	0	0	95-100	75-98	65-95	30-80	25-40	7-18
	49-72	Sandy loam, loam, sandy clay loam, clay loam	SC, SC-SM, SM, ML, CL- ML, CL	A-6, A-4	0	0	80-100	75-98	50-95	25-75	15-40	2-18
	72-95	Loam, gravelly sandy loam, stratified gravelly loamy sand to clay loam	SC-SM, CL, ML, SM, SC, CL-ML	A-6, A-4	0	0	80-100	75-98	50-95	25-75	15-40	2-18
	95-100	Clay, silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	65-100	30-60	12-38
OakA: Ozark-----	0-11	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	0	100	98-100	70-100	36-60	15-26	NP-7
	11-24	Clay loam, sandy clay loam	CL-ML, SC-SM, SC, CL	A-4, A-6	0	0	100	98-100	80-100	36-85	25-40	7-18
	24-59	Sandy clay loam, loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	98-100	80-100	36-85	25-40	7-18
	59-83	Clay loam, sandy clay loam, loam, fine sandy loam	ML, SC-SM, CL, CL-ML, SC, SM	A-4, A-6	0	0	100	98-100	70-100	36-85	15-40	2-18
	83-105	Silty clay loam, clay loam, silty clay, clay	CL, CH	A-6, A-7	0	0	98-100	95-100	90-100	36-95	33-60	12-34
	105-110	Clay, silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	65-100	30-60	12-38

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
OzsA: Ozark-----	0-14	Fine sandy loam	CL-ML, ML, SM, SC-SM	A-4	0	0	100	98-100	70-100	36-60	15-26	NP-7
	14-25	Sandy clay loam, clay loam	CL-ML, SC-SM, CL, SC	A-4, A-6	0	0	100	98-100	80-100	36-85	25-40	7-18
	25-50	Sandy clay loam, clay loam, loam	CL-ML, CL, SC, SC-SM	A-4, A-6	0	0	100	98-100	80-100	36-85	25-40	7-18
	50-73	Sandy clay loam, clay loam, fine sandy loam, loam	SC-SM, SC, CL-ML, CL, SM, ML	A-4, A-6	0	0	100	98-100	70-100	36-85	15-40	2-18
	73-100	Sandy clay loam, clay loam, fine sandy loam, loam	CL-ML, CL, SC, SC-SM, SM, ML	A-4, A-6	0	0	100	98-100	70-100	36-85	15-40	2-18
	100-110	Clay, silty clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	65-100	30-60	12-38
PIT: Pits-----	0-80	Bedrock	---	---	---	---	---	---	---	---	---	---
RakA: Roark-----	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	90-100	57-85	25-35	4-13
	10-24	Clay loam, silty clay loam, clay	CL	A-6, A-7	0	0	98-100	98-100	90-100	65-95	35-50	16-26
	24-34	Clay loam, silty clay loam, clay	CL	A-6, A-7	0	0	98-100	96-100	90-100	60-95	35-50	16-26
	34-49	Clay loam, silty clay loam, clay	CL	A-6, A-7	0	0	98-100	96-100	90-100	60-95	35-50	16-26
	49-67	Fine sandy loam, sandy clay loam, loam, silty clay loam, clay loam	SC-SM, SC, CL, CL-ML	A-4, A-6, A-7	0	0	98-100	95-100	80-98	35-95	15-43	4-20
	67-80	Loamy sand, fine sandy loam, loam, clay loam, sandy clay loam	CL, SC, ML, CL-ML, SM, SC-SM	A-4, A-6, A-2	0	0	95-100	90-100	80-98	15-85	0-50	NP-23

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RKBG: Rock outcrop----	0-60	Bedrock	---	---	---	---	---	---	---	---	---	---
Brico-----	0-11	Cobbly loam	GC, SC, CL	A-4, A-6	0	20-30	70-95	65-90	50-70	40-60	30-36	9-15
	11-24	Very cobbly clay, very cobbly clay loam, cobbly clay, cobbly clay loam	GC, SC	A-2, A-6, A-7	0	20-60	40-85	40-85	30-60	30-50	37-65	16-37
	24-40	Very cobbly clay loam, very cobbly clay, cobbly clay loam, cobbly clay	GC, SC	A-2, A-6, A-7	0	20-60	40-85	40-85	30-60	30-50	37-65	16-37
	40-72	Very cobbly clay loam, cobbly clay loam, extremely cobbly clay	GC, SC	A-2, A-6, A-7	0	20-60	30-85	20-85	15-60	15-50	33-49	13-25
RKO: Rock outcrop----	0-60	Bedrock	---	---	---	---	---	---	---	---	---	---
RuuA: Rups-----	0-7	Silty clay loam	CL	A-6, A-7-6	0	0	100	98-100	95-100	75-90	33-42	12-19
	7-21	Silty clay loam, clay loam, silt loam	CL	A-6, A-7	0	0	100	98-100	95-100	70-90	30-43	8-20
	21-43	Silt loam, silty clay loam, clay loam	CL	A-6, A-7	0	0	100	98-100	95-100	70-90	30-43	8-20
	43-80	Silty clay loam, clay loam, silty clay, clay, stratified silty clay loam to clay	CL	A-6, A-7	0	0	100	90-100	85-100	65-90	30-50	8-23

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RuWA: Rups-----	0-15	Silty clay loam	CL	A-6, A-7-6	0	0	100	98-100	95-100	75-90	33-42	12-19
	15-48	Silt loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	98-100	95-100	70-90	30-43	8-20
	48-80	Stratified silty clay loam to clay, clay loam, silty clay loam, silty clay, clay	CL	A-6, A-7	0	0	100	90-100	85-100	65-90	30-50	8-23
SkCC2: Spikebox-----	0-6	Fine sandy loam	SM, SC-SM, CL-ML, ML	A-4	0	0	90-100	85-100	80-100	35-60	14-26	NP-7
	6-13	Loam, fine sandy loam, very fine sandy loam	SC-SM, CL-ML, SM, ML	A-4	0	0	90-100	85-100	80-100	35-85	14-30	NP-10
	13-40	Bedrock	---	---	---	---	---	---	---	---	---	---
Cobb-----	0-7	Fine sandy loam	SC, SC-SM, SM	A-4, A-2-4	0	0	90-100	90-100	75-98	30-50	17-25	3-8
	7-28	Fine sandy loam, sandy clay loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	80-100	65-100	40-65	20-40	7-18
	28-39	Fine sandy loam, sandy clay loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	90-100	80-100	65-100	40-65	17-40	3-18
	39-80	Bedrock	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SpDB: Springer-----	0-13	Loamy sand	SM, SP-SM	A-2-4	0	0	98-100	95-100	70-96	10-25	0-14	NP-4
	13-42	Fine sandy loam, sandy loam, loamy sand, loamy fine sand	CL-ML, ML, SM, SC-SM	A-4, A-2-4	0	0	98-100	95-100	75-99	11-60	14-26	NP-7
	42-57	Fine sand, loamy sand, loamy fine sand, sandy loam	SW-SM, SM	A-2-4, A-3	0	0	98-100	95-100	70-96	8-25	0-14	NP-4
	57-80	Fine sandy loam, sandy clay loam	SC-SM, SM, CL-ML, CL, ML, SC	A-2-4, A-4	0	0	98-100	95-100	75-99	11-60	14-30	2-10
Devol-----	0-14	Loamy sand	SM	A-2	0	0	98-100	98-100	85-100	15-35	0-14	NP
	14-29	Fine sandy loam	SC-SM, CL-ML, ML, SM	A-2, A-4	0	0	98-100	98-100	90-100	25-60	14-26	NP-7
	29-45	Fine sandy loam, loamy fine sand	ML, SC-SM, SM, CL-ML	A-2, A-4	0	0	98-100	98-100	90-100	15-60	0-26	NP-7
	45-65	Loamy sand, fine sand, loamy fine sand, fine sandy loam	SC-SM, SM	A-2, A-4	0	0	98-100	98-100	80-100	5-50	0-26	NP-7
	65-80	Fine sand, loamy sand, loamy fine sand, fine sandy loam	SM, SC-SM	A-2, A-4	0	0	98-100	98-100	50-100	5-50	0-26	NP-7

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SurA: Spur-----	0-14	Clay loam	CL	A-6	0	0	100	100	96-100	75-90	31-40	10-18
	14-30	Sandy clay loam, clay loam, loam	SC, CL-ML, CL, SC-SM	A-6, A-4	0	0	100	100	90-100	36-90	25-40	7-18
	30-51	Sandy clay loam, clay loam, loam	CL-ML, SC, CL, SC-SM	A-6, A-4	0	0	100	100	90-100	36-90	25-40	7-18
	51-80	Stratified fine sandy loam to clay loam, fine sandy loam, loam, sandy clay loam, clay loam	CL-ML, SC-SM, SC, CL	A-6, A-4	0	0	100	100	90-100	36-90	20-40	4-18
SuuA: Spur-----	0-10	Clay loam	CL	A-6	0	0	100	100	96-100	75-90	31-40	10-18
	10-16	Clay loam, loam	CL	A-6	0	0	100	100	96-100	75-90	30-40	8-18
	16-48	Sandy clay loam, clay loam, loam	SC, CL-ML, CL, SC-SM	A-6, A-4	0	0	100	100	90-100	36-90	25-40	7-18
	48-80	Clay loam, sandy clay loam, loam, fine sandy loam, stratified fine sandy loam to clay loam	SC-SM, SC, CL-ML, CL	A-6, A-4	0	0	100	100	90-100	36-90	20-40	4-18

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SuwA: Spur-----	0-8	Clay loam	CL	A-6	0	0	100	100	96-100	75-90	31-40	10-18
	8-17	Loam, clay loam, sandy clay loam	SC-SM, SC, CL-ML, CL	A-6, A-4	0	0	100	100	90-100	36-90	25-40	7-18
	17-35	Clay loam, loam, sandy clay loam	CL-ML, CL, SC-SM, SC	A-6, A-4	0	0	100	100	90-100	36-90	25-40	7-18
	35-49	Loam, clay loam, sandy clay loam	CL-ML, SC, CL, SC-SM	A-6, A-4	0	0	100	100	90-100	36-90	25-40	7-18
	49-80	Stratified fine sandy loam to clay loam, fine sandy loam, loam, sandy clay loam, clay loam	SC-SM, CL, CL-ML, SC	A-6, A-4	0	0	100	100	90-100	36-90	20-40	4-18
TARD: Talpa-----	0-7	Loam	ML, CL	A-6, A-4	0	0-5	95-100	90-100	85-98	60-90	30-35	7-13
	7-40	Bedrock	---	---	---	---	---	---	---	---	---	---
Aspermont-----	0-10	Silt loam	ML, CL	A-4, A-6	0	0	98-100	90-100	80-100	65-90	30-37	7-14
	10-42	Silty clay loam, clay loam, loam, silt loam	CL, ML	A-6, A-7, A-4	0	0	98-100	90-100	85-100	65-95	30-43	7-20
	42-80	Silty clay, silty clay loam, clay loam, clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	65-100	30-60	12-38

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
TARD: Rock outcrop----	0-60	Bedrock	---	---	---	---	---	---	---	---	---	---
TilA: Tillman-----	0-8	Clay loam	CL	A-6	0	0	100	100	98-100	70-90	30-43	11-20
	8-15	Clay loam, silty clay loam, silty clay, clay	CL, CH	A-6, A-7-6	0	0	98-100	93-100	90-98	70-95	37-55	15-35
	15-45	Silty clay loam, silty clay, clay loam, clay	CL, CH	A-6, A-7-6	0	0-5	95-100	90-100	80-97	60-90	37-55	15-35
	45-62	Clay loam, silty clay, clay, silty clay loam	CL, CH	A-6, A-7-6	0	0-5	95-100	90-100	80-97	60-90	37-55	15-35
	62-78	Silty clay loam, silty clay, clay loam, clay	CH, CL	A-6, A-7-6	0	0-5	95-100	90-100	80-97	60-90	37-60	15-35
	78-90	Silty clay, clay	CL, CH	A-6, A-7-6	0	0-5	95-100	90-100	80-97	60-90	40-60	18-35
	90-100	Silty clay, clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	60-100	30-60	12-38

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
TilB: Tillman-----	0-6	Clay loam	CL	A-6	0	0	100	100	98-100	70-90	30-43	11-20
	6-10	Clay, clay loam, silty clay, silty clay loam	CL, CH	A-6, A-7-6	0	0	98-100	93-100	90-98	70-95	37-55	15-35
	10-25	Clay, silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7-6	0	0	98-100	93-100	90-98	70-95	37-55	15-35
	25-48	Clay, silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7-6	0	0-5	95-100	90-100	80-97	60-90	37-55	15-35
	48-60	Silty clay loam, clay loam, clay, silty clay	CH, CL	A-6, A-7-6	0	0-5	95-100	90-100	80-97	60-90	37-55	15-35
	60-82	Silty clay, silty clay loam, clay, clay loam	CH, CL	A-6, A-7-6	0	0-5	95-100	90-100	80-97	60-90	37-60	15-35
	82-90	Silty clay, clay	CL, CH	A-6, A-7-6	0	0-5	95-100	90-100	80-97	60-90	40-60	18-35
	90-100	Silty clay, clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	60-100	30-60	12-38
TipA: Tipton-----	0-8	Loam	CL, CL-ML	A-4	0	0	100	100	95-100	65-85	25-33	4-12
	8-15	Loam	CL-ML, CL	A-4	0	0	100	100	95-100	65-85	25-33	4-12
	15-25	Loam, clay loam, sandy clay loam	SC, SC-SM, CL, CL-ML	A-4, A-6	0	0	100	99-100	95-100	36-85	25-40	7-18
	25-41	Loam, sandy clay loam, clay loam	SC-SM, CL-ML, CL, SC	A-4, A-6	0	0	100	99-100	95-100	36-85	25-40	7-18
	41-66	Sandy clay loam, clay loam, loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	100	98-100	95-100	36-85	25-40	7-18
	66-80	Clay loam, loam, sandy loam, sandy clay loam	SC, ML, CL- ML, SC-SM, SM, CL	A-2-4, A-4, A-6	0	0	100	93-100	80-100	30-85	20-40	2-18

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
TlvB: Tilvern-----	0-5	Clay loam	CL	A-6, A-7-6	0	0-3	95-100	90-100	90-100	70-95	35-50	15-26
	5-11	Silty clay, clay, clay loam	CL, CH	A-6, A-7-6	0	0-3	95-100	90-100	90-100	70-97	35-60	16-35
	11-31	Silty clay, clay	CL, CH	A-6, A-7-6	0	0-3	95-100	90-100	90-100	80-97	38-60	18-35
	31-44	Silty clay, clay, clay loam	CL, CH	A-6, A-7-6	0	0-3	95-100	90-100	90-100	70-95	35-60	16-35
	44-51	Silty clay, clay, clay loam	CH, CL	A-6, A-7-6	0	0-3	95-100	90-100	90-100	70-95	35-60	16-35
	51-80	Silty clay, clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
Tpfa: Tipton-----	0-7	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	80-100	36-60	15-26	NP-7
	7-13	Fine sandy loam	CL-ML, ML, SM, SC-SM	A-4	0	0	100	100	80-100	36-60	15-26	NP-7
	13-24	Loam, sandy clay loam	ML, CL-ML, SM, SC, CL	A-4, A-6	0	0	100	100	90-100	36-85	22-34	2-12
	24-47	Clay loam, sandy clay loam, loam	SC-SM, CL-ML, CL, SC	A-4, A-6	0	0	100	99-100	90-100	36-85	25-40	7-18
	47-63	Sandy clay loam, loam, clay loam	CL, CL-ML, SC-SM, SC	A-4, A-6	0	0	100	99-100	90-100	36-85	25-40	7-18
	63-80	Sandy loam, loam, sandy clay loam, clay loam	SC-SM, CL-ML, SM, SC, ML, CL	A-4, A-6, A- 2-4	0	0	100	93-100	70-100	30-85	20-40	2-18

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
TrwB:												
Treadway-----	0-7	Silty clay loam	CL	A-6, A-7	0	0	95-100	92-100	85-100	80-98	35-50	12-25
	7-20	Silty clay loam, silty clay, clay loam, clay	CH, CL	A-7, A-6	0	0	90-100	85-100	80-98	70-98	35-60	15-34
	20-64	Silty clay loam, clay, silty clay, clay loam	CL, CH	A-7, A-6	0	0	90-100	85-100	80-98	70-98	35-60	15-34
	64-80	Silty clay loam, clay loam, silty clay, clay, stratified silty clay loam to clay	CH, CL	A-7, A-6	0	0	85-97	75-92	72-92	60-92	35-60	15-34
UST:												
Ustorthents-----	0-60	Variable	---	---	---	---	---	---	---	---	---	---
VeKE:												
Vernon-----	0-6	Clay loam	CL	A-6, A-7-6	0	0	95-100	90-100	90-100	70-95	35-50	16-26
	6-26	Clay, silty clay	CL, CH	A-6, A-7-6	0	0	95-100	90-100	90-100	80-98	38-60	18-40
	26-80	Clay, silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
Knoco-----												
	0-6	Silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	80-100	75-100	60-90	30-60	12-38
	6-16	Clay, silty clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	75-100	70-100	30-60	12-38
	16-60	Clay, silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
VerC:												
Vernon-----	0-6	Clay loam	CL	A-6, A-7-6	0	0	95-100	90-100	90-100	70-95	35-50	16-26
	6-26	Clay, silty clay	CH, CL	A-6, A-7-6	0	0	95-100	90-100	90-100	80-98	38-60	18-40
	26-35	Clay, silty clay	CL, CH	A-6, A-7-6	0	0	95-100	90-100	90-100	80-98	38-60	18-40
	35-80	Clay, silty clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
VeTE: Vernon-----	0-7	Clay loam	CL	A-6, A-7-6	0	0	95-100	90-100	90-100	70-95	35-50	16-26
	7-16	Clay, silty clay	CH, CL	A-6, A-7-6	0	0	95-100	90-100	90-100	80-98	38-60	18-40
	16-25	Clay, silty clay	CH, CL	A-6, A-7-6	0	0	95-100	90-100	90-100	80-98	38-60	18-40
	25-38	Clay, silty clay	CL, CH	A-6, A-7-6	0	0-5	90-100	85-100	70-100	70-98	38-60	18-40
	38-80	Clay, silty clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
Talpa-----	0-9	Loam	ML, CL	A-6, A-4	0	0-5	95-100	90-100	85-98	60-90	30-35	7-13
	9-40	Bedrock	---	---	---	---	---	---	---	---	---	---
W: Water-----	0-80	Water	---	---	---	---	---	---	---	---	---	---
WodB: Woods-----	0-8	Clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-50	12-26
	8-15	Clay, silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	98-100	90-99	37-60	15-34
	15-33	Clay, silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	98-100	90-99	37-60	15-34
	33-49	Clay, silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	49-64	Clay loam, clay, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	100	96-100	80-99	37-60	15-34
	64-80	Clay loam, clay, silty clay loam, silty clay	CH, CL	A-4, A-6, A-7	0	0	100	100	96-100	65-99	30-60	9-34

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WslA: Westola-----	0-12	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	0	100	95-100	90-100	36-60	15-26	NP-7
	12-50	Stratified fine sandy loam to loam, fine sandy loam, very fine sandy loam, loam	SC-SM, ML, CL-ML, SM	A-4	0	0	100	95-100	90-100	36-85	15-30	NP-8
	50-80	Stratified sand to sandy loam, stratified loamy fine sand to loam	SM, SC-SM, CL-ML, ML	A-2-4, A-4	0	0	100	95-100	90-100	15-85	10-30	NP-8
WstA: Westola-----	0-8	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	95-100	90-100	36-60	15-26	NP-7
	8-19	Loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	60-85	22-29	2-7
	19-30	Fine sandy loam, very fine sandy loam, loam, stratified fine sandy loam to loam	SM, ML, SC- SM, CL-ML	A-4	0	0	100	95-100	90-100	36-85	15-30	NP-8
	30-80	Stratified fine sandy loam to loam, fine sandy loam, very fine sandy loam, loam, stratified sand to sandy loam	SM, CL-ML, SC-SM, ML	A-4, A-2-4	0	0	100	95-100	90-100	15-85	15-30	NP-8

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Wt1A: Westill-----	0-5	Clay loam	CL	A-6	0	0	100	100	98-100	70-90	30-43	11-20
	5-15	Clay, clay loam, silty clay, silty clay loam	CH, CL	A-6, A-7-6	0	0	98-100	93-100	90-98	70-95	37-55	15-35
	15-24	Clay, clay loam, silty clay, silty clay loam	CL, CH	A-6, A-7-6	0	0	98-100	93-100	90-98	70-95	37-55	15-35
	24-55	Clay, clay loam, silty clay, silty clay loam	CH, CL	A-6, A-7-6	0	0	95-100	90-100	80-97	60-90	37-60	15-35
	55-70	Silty clay, clay, paragravelly silty clay, paragravelly clay	CH, CL	A-6, A-7-6	0	0-2	70-100	50-100	48-97	45-90	40-60	18-35
	70-80	Silty clay, clay	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	70-100	60-100	30-60	12-38
Wt1B: Westill-----	0-9	Clay loam	CL	A-6	0	0	100	100	98-100	70-90	30-43	11-20
	9-16	Clay, clay loam, silty clay, silty clay loam	CL, CH	A-6, A-7-6	0	0	98-100	93-100	90-98	70-95	37-55	15-35
	16-47	Clay, clay loam, silty clay, silty clay loam	CH, CL	A-6, A-7-6	0	0	95-100	90-100	80-97	60-90	37-60	15-35
	47-56	Clay, clay loam, silty clay, silty clay loam	CH, CL	A-6, A-7-6	0	0-2	90-100	85-100	80-97	60-90	37-60	15-35
	56-68	Silty clay, paragravelly silty clay, clay, paragravelly clay	CL, CH	A-6, A-7-6	0	0-2	70-100	50-100	48-97	45-90	40-60	18-35
	68-80	Silty clay, clay	CL, CH	A-6, A-7-6	0	0-2	90-100	85-100	70-100	60-100	30-60	12-38

Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
AcmA:														
Acme-----	0-15	---	---	12-27	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-2.0	.37	.37	3	4L	86
	15-20	---	---	18-35	1.30-1.70	0.6-2	0.10-0.18	0.0-2.9	0.5-1.0	.37	.37			
	20-40	---	---	18-35	1.30-1.70	0.6-2	0.10-0.18	0.0-2.9	0.2-0.8	.37	.37			
	40-80	---	---	10-35	1.30-1.85	0.6-2	0.07-0.15	0.0-2.9	0.0-0.5	.37	.37			
ArHF:														
Arnett-----	0-15	---	---	10-20	1.40-1.65	2-6	0.10-0.19	0.0-3.0	0.5-1.0	.24	.24	5	3	86
	15-40	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	2.0-6.0	0.1-0.7	.28	.32			
	40-58	---	---	18-35	1.30-1.70	0.6-2	0.09-0.17	0.0-3.0	0.1-0.5	.20	.32			
	58-80	---	---	10-30	1.30-1.70	0.6-6	0.09-0.17	0.0-3.0	0.0-0.5	.20	.32			
Hardeman-----	0-7	---	---	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	7-40	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	40-60	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	60-80	---	---	5-18	1.35-1.55	2-20	0.07-0.15	0.0-2.9	0.1-0.5	.28	.28			
ArnB:														
Arnett-----	0-7	---	---	10-20	1.40-1.65	2-6	0.10-0.19	0.0-3.0	0.5-1.0	.24	.24	5	3	86
	7-26	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	2.0-6.0	0.1-0.7	.28	.32			
	26-46	---	---	10-30	1.30-1.70	0.6-6	0.09-0.17	0.0-3.0	0.0-0.5	.20	.32			
	46-80	---	---	7-35	1.30-1.70	0.6-6	0.04-0.18	0.0-3.0	0.0-0.5	.20	.28			
ArnC:														
Arnett-----	0-7	---	---	10-20	1.40-1.65	2-6	0.10-0.19	0.0-3.0	0.5-1.0	.24	.24	5	3	86
	7-17	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	2.0-6.0	0.1-0.7	.28	.32			
	17-31	---	---	18-35	1.30-1.70	0.6-2	0.09-0.17	0.0-3.0	0.1-0.5	.20	.32			
	31-44	---	---	10-30	1.30-1.70	0.6-6	0.09-0.17	0.0-3.0	0.0-0.5	.20	.32			
	44-80	---	---	7-35	1.30-1.70	0.6-6	0.04-0.18	0.0-3.0	0.0-0.5	.20	.28			
AsmB:														
Aspermont-----	0-6	---	---	18-27	1.25-1.55	0.6-2	0.15-0.24	1.0-5.9	0.5-2.0	.37	.37	4	4L	86
	6-34	---	---	18-35	1.30-1.70	0.2-2	0.15-0.22	3.0-5.9	0.0-0.5	.37	.37			
	34-43	---	---	18-35	1.30-1.70	0.2-2	0.12-0.22	3.0-5.9	0.0-0.5	.37	.37			
	43-50	---	---	18-40	1.30-1.70	0.2-2	0.12-0.22	3.0-5.9	0.0-0.5	.37	.37			
	50-80	---	---	27-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
AsmC:														
Aspermont-----	0-8	---	---	18-27	1.25-1.55	0.6-2	0.15-0.24	1.0-5.9	0.5-2.0	.37	.37	4	4L	86
	8-35	---	---	18-35	1.30-1.70	0.2-2	0.15-0.22	3.0-5.9	0.0-0.5	.37	.37			
	35-50	---	---	18-35	1.30-1.70	0.2-2	0.12-0.22	3.0-5.9	0.0-0.5	.37	.37			
	50-80	---	---	27-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
BekA:														
Beckman-----	0-11	---	---	40-60	1.25-1.45	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-3.0	.37	.37	5	4	86
	11-44	---	---	40-60	1.35-1.60	0.0015-0.06	0.08-0.12	6.0-8.9	0.0-1.0	.37	.37			
	44-80	---	---	40-60	1.35-1.60	0.0015-0.06	0.08-0.12	6.0-8.9	0.0-1.0	.37	.37			
BfdB:														
Burford-----	0-5	---	---	18-27	1.40-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-2.0	.37	.37	4	6	48
	5-12	---	---	20-35	1.40-1.60	0.2-2	0.15-0.22	3.0-5.9	0.0-0.5	.37	.37			
	12-30	---	---	20-35	1.40-1.60	0.2-2	0.15-0.22	3.0-5.9	0.0-0.5	.37	.37			
	30-43	---	---	27-50	1.35-1.70	0.06-0.6	0.12-0.22	3.0-8.9	0.0-0.5	.37	.37			
	43-80	---	---	27-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
BfdC:														
Burford-----	0-6	---	---	18-27	1.40-1.55	0.6-2	0.15-0.24	0.0-2.9	0.5-2.0	.37	.37	4	6	48
	6-24	---	---	20-35	1.40-1.60	0.2-2	0.15-0.22	3.0-5.9	0.0-0.5	.37	.37			
	24-40	---	---	27-50	1.35-1.70	0.06-0.6	0.12-0.22	3.0-8.9	0.0-0.5	.37	.37			
	40-80	---	---	27-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
CobB:														
Cobb-----	0-7	---	---	6-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.5-2.0	.24	.24	3	3	86
	7-29	---	---	18-35	1.30-1.70	0.6-2	0.13-0.19	0.0-2.9	0.0-0.8	.32	.32			
	29-34	---	---	10-35	1.30-1.70	0.6-6	0.10-0.19	0.0-2.9	0.0-0.5	.32	.32			
	34-80	---	---	---	1.85-2.35	0.2-0.6	---	---	---	---	---			
CVRD:														
Cottonwood-----	0-5	---	---	18-27	1.30-1.50	0.6-2	0.11-0.18	0.0-2.9	0.5-1.0	.37	.37	1	4L	86
	5-8	---	---	18-35	1.30-1.70	0.6-2	0.11-0.18	0.0-2.9	0.1-0.5	.37	.37			
	8-20	---	---	---	1.85-2.35	0.0015-0.06	---	---	---	---	---			
Vinson-----	0-4	---	---	15-27	1.25-1.50	0.6-2	0.15-0.22	0.0-2.9	1.0-2.0	.37	.37	3	4L	86
	4-15	---	---	18-30	1.30-1.75	0.6-2	0.15-0.22	3.0-5.9	0.5-1.5	.32	.32			
	15-22	---	---	18-30	1.30-1.75	0.6-2	0.15-0.22	3.0-5.9	0.0-0.5	.32	.32			
	22-28	---	---	---	1.85-2.00	0.0015-0.6	---	---	---	---	---			
	28-60	---	---	---	1.85-2.35	0.0015-0.06	---	---	---	---	---			
Rock outcrop-----	0-60	---	---	---	1.85-2.35	0.0015-0.06	---	---	---	---	---	--	---	---

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
DAM: Dam-----	0-80	---	---	---	---	0.06-2	---	---	---	---	---	--	---	---
DcbB: Decobb-----	0-8	---	---	6-18	1.30-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	8-18	---	---	6-18	1.30-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24			
	18-50	---	---	20-35	1.45-1.70	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.32	.32			
	50-63	---	---	10-25	1.45-1.70	0.6-6	0.12-0.16	0.0-2.9	0.1-0.5	.32	.32			
	63-80	---	---	---	1.85-2.35	0.2-0.6	---	---	---	---	---			
DeSD: Devol-----	0-8	75-95	0-22	2-8	1.45-1.70	6-20	0.07-0.11	0.0-2.9	0.2-1.0	.17	.17	5	2	134
	8-28	55-85	0-37	8-18	1.40-1.70	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.20			
	28-47	55-90	0-43	2-18	1.40-1.70	2-20	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	47-62	55-95	0-43	2-10	1.50-1.75	2-20	0.05-0.12	0.0-2.9	0.0-0.2	.20	.20			
	62-80	55-95	0-43	2-10	1.50-1.75	2-20	0.05-0.12	0.0-2.9	0.0-0.2	.17	.17			
Springer-----	0-15	70-90	0-28	2-10	1.45-1.65	6-20	0.04-0.10	0.0-2.9	0.2-1.0	.17	.17	5	2	134
	15-41	50-80	2-40	6-18	1.40-1.70	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.20	.20			
	41-52	70-95	0-28	2-12	1.50-1.75	6-20	0.02-0.10	0.0-2.9	0.1-0.5	.20	.20			
	52-70	50-80	0-40	10-25	1.40-1.70	0.6-6	0.10-0.16	0.0-2.9	0.1-0.5	.24	.24			
	70-80	55-95	0-43	2-12	1.50-1.75	2-20	0.05-0.12	0.0-2.9	0.0-0.2	.20	.20			
EatA: Eastall-----	0-12	---	---	40-60	1.25-1.45	0.0015-0.06	0.12-0.18	6.0-15.0	0.5-2.0	.37	.37	5	4	86
	12-19	---	---	40-60	1.30-1.55	0.0015-0.06	0.12-0.18	6.0-15.0	0.1-1.0	.37	.37			
	19-56	---	---	40-60	1.30-1.60	0.0015-0.06	0.12-0.18	6.0-15.0	0.1-1.0	.37	.37			
	56-76	---	---	40-60	1.30-1.60	0.0015-0.06	0.12-0.18	6.0-15.0	0.1-1.0	.37	.37			
	76-95	---	---	30-60	1.30-1.70	0.06-0.2	0.12-0.22	6.0-15.0	0.1-0.5	.37	.37			
EdsB: Eda-----	0-11	---	---	1-7	1.50-1.65	6-20	0.02-0.08	0.0-2.9	0.5-1.0	.10	.10	5	1	220
	11-35	---	---	1-8	1.50-1.75	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
	35-80	---	---	1-8	1.50-1.75	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
EdsD: Eda-----	0-13	---	---	1-7	1.50-1.65	6-20	0.02-0.08	0.0-2.9	0.5-1.0	.10	.10	5	1	220
	13-50	---	---	1-8	1.50-1.75	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
	50-80	---	---	1-8	1.50-1.75	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
EdsF: Eda-----	0-18	---	---	1-7	1.50-1.65	6-20	0.02-0.08	0.0-2.9	0.5-1.0	.10	.10	5	1	220
	18-40	---	---	1-8	1.50-1.75	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			
	40-80	---	---	1-8	1.50-1.75	6-20	0.02-0.11	0.0-2.9	0.0-0.5	.15	.15			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
FayB:														
Farry-----	0-10	---	---	8-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	1.0-3.0	.20	.24	5	3	86
	10-36	---	---	18-27	1.40-1.70	0.6-2	0.11-0.20	0.0-2.9	0.5-1.0	.32	.37			
	36-50	---	---	5-27	1.40-1.70	0.6-6	0.07-0.17	0.0-2.9	0.0-0.5	.24	.32			
	50-80	---	---	3-20	1.40-1.70	2-20	0.05-0.16	0.0-2.9	0.0-0.5	.20	.32			
FraB:														
Frankirk-----	0-6	---	---	18-27	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	6-18	20-60	---	27-45	1.30-1.70	0.2-0.6	0.12-0.18	3.0-5.9	1.0-2.0	.37	.37			
	18-52	20-60	---	35-45	1.30-1.70	0.2-0.6	0.12-0.18	3.0-5.9	0.5-1.5	.37	.37			
	52-65	20-65	---	20-30	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.2-0.8	.37	.37			
	65-80	20-70	---	20-30	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.0-0.5	.37	.37			
GdfB:														
Grandfield-----	0-15	---	---	10-18	1.40-1.65	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	15-32	---	---	18-30	1.45-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	32-49	---	---	15-30	1.40-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	49-56	---	---	10-25	1.40-1.70	0.6-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
	56-80	---	---	5-20	1.40-1.70	2-20	0.06-0.15	0.0-2.9	0.0-0.5	.28	.28			
GfGB:														
Grandmore-----	0-7	---	---	10-18	1.40-1.65	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	7-24	---	---	18-30	1.40-1.70	0.6-2	0.14-0.19	0.0-2.9	0.5-1.0	.32	.32			
	24-43	---	---	15-30	1.40-1.70	0.6-2	0.11-0.19	0.0-2.9	0.3-0.7	.32	.32			
	43-70	---	---	30-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.7	.32	.32			
	70-80	---	---	27-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.7	.32	.32			
Grandfield-----	0-8	---	---	10-18	1.40-1.65	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	8-17	---	---	18-30	1.45-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	17-55	---	---	15-30	1.40-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	55-72	---	---	10-25	1.40-1.70	0.6-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
	72-80	---	---	5-20	1.40-1.70	2-20	0.06-0.15	0.0-2.9	0.0-0.5	.28	.28			
GlGB:														
Grandmore-----	0-11	---	---	3-10	1.40-1.65	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	11-22	---	---	18-30	1.40-1.70	0.6-2	0.14-0.19	0.0-2.9	0.5-1.0	.32	.32			
	22-42	---	---	15-30	1.40-1.70	0.6-2	0.11-0.19	0.0-2.9	0.3-0.7	.32	.32			
	42-72	---	---	30-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.7	.32	.32			
	72-80	---	---	27-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.7	.32	.32			
Grandfield-----	0-8	---	---	5-10	1.45-1.65	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	8-28	---	---	18-30	1.45-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	28-55	---	---	15-30	1.40-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	55-75	---	---	10-25	1.40-1.70	0.6-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
	75-80	---	---	5-20	1.40-1.70	2-20	0.06-0.15	0.0-2.9	0.0-0.5	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
GlsB:														
Grandfield-----	0-7	---	---	5-10	1.45-1.65	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	7-27	---	---	18-30	1.45-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	27-40	---	---	15-30	1.40-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	40-54	---	---	10-25	1.40-1.70	0.6-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
	54-80	---	---	5-20	1.40-1.70	2-20	0.06-0.15	0.0-2.9	0.0-0.5	.28	.28			
GlsD:														
Grandfield-----	0-10	---	---	5-10	1.45-1.65	6-20	0.07-0.11	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	10-35	---	---	18-30	1.45-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	35-55	---	---	15-30	1.40-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	55-72	---	---	10-25	1.40-1.70	0.6-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
	72-80	---	---	5-20	1.40-1.70	2-20	0.06-0.15	0.0-2.9	0.0-0.5	.28	.28			
GmuA:														
Gracemont-----	0-6	---	---	10-18	1.40-1.65	0.6-6	0.13-0.19	0.0-2.9	0.0-0.5	.20	.20	5	3	86
	6-20	---	---	10-18	1.40-1.70	0.6-6	0.13-0.19	0.0-2.9	0.0-0.5	.20	.20			
	20-80	---	---	7-32	1.40-1.75	0.6-20	0.06-0.20	0.0-2.9	0.0-0.5	.20	.20			
GmwA:														
Gracemont-----	0-4	---	---	10-18	1.40-1.65	0.6-6	0.13-0.19	0.0-2.9	0.0-0.5	.20	.20	5	3	86
	4-35	---	---	10-18	1.40-1.70	0.6-6	0.13-0.19	0.0-2.9	0.0-0.5	.20	.20			
	35-80	---	---	5-32	1.40-1.75	0.6-20	0.06-0.20	0.0-2.9	0.0-0.5	.20	.20			
GsEA:														
Gracemore-----	0-8	---	---	10-25	1.30-1.55	2-6	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32	5	5	56
	8-72	---	---	2-10	1.50-1.70	2-20	0.03-0.09	0.0-2.9	0.0-0.5	.15	.15			
Ezell-----	0-8	---	---	15-25	1.30-1.55	2-6	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	8-80	32-100	0-50	2-10	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.5-1.0	.17	.17			
HdmA:														
Hardeman-----	0-16	---	---	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	16-55	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	55-72	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	72-80	---	---	5-18	1.35-1.55	2-20	0.07-0.15	0.0-2.9	0.1-0.5	.28	.28			
HdmB:														
Hardeman-----	0-6	---	---	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	6-46	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	46-80	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
HdmC:														
Hardeman-----	0-13	---	---	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	13-35	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	35-62	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	62-80	---	---	5-18	1.35-1.55	2-20	0.07-0.15	0.0-2.9	0.1-0.5	.28	.28			
HdmE:														
Hardeman-----	0-12	---	---	10-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	12-28	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	28-60	---	---	12-18	1.35-1.55	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	60-80	---	---	5-18	1.35-1.55	2-20	0.07-0.15	0.0-2.9	0.1-0.5	.28	.28			
HeyB:														
Heatly-----	0-22	---	---	3-10	1.50-1.65	6-20	0.03-0.07	0.0-2.9	0.1-1.0	.17	.17	5	1	250
	22-43	---	---	20-35	1.45-1.70	0.6-2	0.13-0.19	0.0-2.9	0.1-0.5	.24	.24			
	43-62	---	---	15-35	1.45-1.70	0.6-6	0.10-0.19	0.0-2.9	0.1-0.5	.24	.24			
	62-72	---	---	12-25	1.45-1.70	0.6-6	0.10-0.16	0.0-2.9	0.1-0.5	.24	.24			
	72-80	---	---	10-25	1.45-1.70	0.6-6	0.10-0.16	0.0-2.9	0.1-0.5	.24	.24			
Hkfa:														
Headrick-----	0-9	---	---	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	9-45	---	---	18-30	1.40-1.70	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.32	.32			
	45-72	---	---	30-50	1.30-1.70	0.2-0.6	0.12-0.20	3.0-5.9	0.0-1.0	.32	.32			
	72-80	---	---	27-50	1.30-1.70	0.2-0.6	0.10-0.20	3.0-5.9	0.0-1.0	.32	.32			
HksA:														
Headrick-----	0-5	---	---	3-10	1.40-1.65	6-20	0.06-0.10	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	5-32	---	---	18-30	1.40-1.70	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.32	.32			
	32-66	---	---	30-50	1.30-1.70	0.2-0.6	0.12-0.20	3.0-5.9	0.0-1.0	.32	.32			
	66-80	---	---	27-50	1.30-1.70	0.2-0.6	0.10-0.20	3.0-5.9	0.0-1.0	.32	.32			
Hola:														
Hollister-----	0-9	---	---	30-40	1.30-1.50	0.2-0.6	0.15-0.22	6.0-8.9	1.0-3.0	.43	.43	5	6	48
	9-23	---	---	35-50	1.30-1.65	0.0015-0.06	0.12-0.20	6.0-8.9	1.0-2.0	.32	.32			
	23-72	---	---	35-50	1.30-1.65	0.0015-0.06	0.12-0.20	6.0-8.9	0.1-0.8	.32	.32			
	72-110	---	---	35-50	1.30-1.65	0.0015-0.2	0.11-0.17	6.0-8.9	0.1-0.5	.32	.32			
	110-138	---	---	35-50	1.30-2.00	0.0000-0.2	0.11-0.17	6.0-8.9	0.0-0.2	.32	.32			
HrAC:														
Harmon-----	0-7	---	---	10-25	1.30-1.55	0.6-2	0.10-0.14	0.0-2.9	0.0-1.0	.20	.37	2	4L	86
	7-16	---	---	10-25	1.30-1.55	0.6-2	0.04-0.12	0.0-2.9	0.0-1.0	.10	.37			
	16-40	---	---	---	1.85-2.35	0.0000-0.2	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
HrAC:														
Aspermont-----	0-5	---	---	18-27	1.25-1.55	0.6-2	0.15-0.24	1.0-5.9	0.5-2.0	.37	.37	4	4L	86
	5-40	---	---	20-35	1.30-1.70	0.2-2	0.15-0.22	3.0-5.9	0.0-0.5	.37	.37			
	40-50	---	---	20-40	1.30-1.70	0.2-2	0.12-0.22	3.0-5.9	0.0-0.5	.37	.37			
	50-80	---	---	27-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
JesC:														
Jester-----	0-7	---	---	1-10	1.50-1.65	6-20	0.05-0.08	0.0-2.9	0.5-1.0	.15	.15	5	1	220
	7-45	---	---	1-10	1.50-1.75	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
	45-80	---	---	1-10	1.50-1.75	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
JesF:														
Jester-----	0-8	---	---	1-10	1.50-1.65	6-20	0.05-0.08	0.0-2.9	0.5-1.0	.15	.15	5	1	220
	8-80	---	---	1-10	1.50-1.75	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.15	.15			
KcRG:														
Knoco-----	0-3	---	---	40-60	1.25-1.55	0.0015-0.06	0.10-0.17	1.0-4.0	0.5-1.0	.32	.32	1	8	0
	3-9	---	---	40-60	1.45-1.70	0.0015-0.06	0.03-0.10	1.0-4.0	0.0-0.5	.32	.32			
	9-60	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
Rock outcrop-----	0-60	---	---	---	1.85-2.35	0.0000-0.06	---	---	---	---	---	--	---	---
KoBE:														
Knoco-----	0-6	---	---	40-60	1.25-1.55	0.0015-0.06	0.10-0.17	1.0-4.0	0.5-1.0	.32	.37	1	4	86
	6-16	---	---	40-60	1.45-1.70	0.0015-0.06	0.03-0.10	1.0-4.0	0.1-0.5	.32	.32			
	16-60	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
Badland-----	0-60	---	---	---	1.85-2.35	0.0000-0.2	---	---	---	---	---	--	---	---
LacB:														
La Casa-----	0-6	---	---	27-35	1.30-1.55	0.2-0.6	0.15-0.22	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	6-12	---	---	35-45	1.30-1.70	0.06-0.2	0.12-0.22	3.0-5.9	1.0-2.0	.37	.37			
	12-34	---	---	35-45	1.30-1.70	0.06-0.2	0.12-0.22	3.0-5.9	0.1-0.5	.32	.32			
	34-64	---	---	30-45	1.30-1.70	0.06-0.6	0.12-0.22	3.0-5.9	0.1-0.5	.37	.37			
	64-81	---	---	30-45	1.30-1.70	0.06-0.6	0.12-0.22	3.0-5.9	0.0-0.3	.37	.37			
	81-91	---	---	30-50	1.30-2.00	0.0000-0.6	0.06-0.15	6.0-8.9	0.0-0.1	.32	.32			
LDF:														
Landfill-----	0-80	---	---	---	---	0.0000-6	---	---	---	---	---	--	---	---
LnuA:														
Lincoln-----	0-8	---	---	1-15	1.45-1.65	6-20	0.06-0.11	0.0-2.9	0.0-0.5	.17	.17	5	2	134
	8-21	---	---	1-10	1.50-1.75	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.17	.17			
	21-80	---	---	1-10	1.50-1.75	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.17	.17			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
LnWA:														
Lincoln-----	0-5	---	---	1-15	1.45-1.65	6-20	0.06-0.11	0.0-2.9	0.0-0.5	.17	.17	5	2	134
	5-15	---	---	1-10	1.50-1.75	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.17	.17			
	15-80	32-100	0-30	1-10	1.50-1.75	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.17	.17			
Westola-----	0-5	---	---	10-18	1.40-1.65	2-6	0.11-0.18	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	5-30	40-80	---	5-18	1.30-1.70	2-6	0.10-0.20	0.0-2.9	0.0-0.5	.32	.32			
	30-80	43-100	0-50	5-18	1.30-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
M-W: Water.														
MagA:														
Madge-----	0-8	---	---	15-25	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	8-18	---	---	15-25	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37			
	18-26	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	0.0-2.9	0.5-2.0	.37	.37			
	26-47	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	0.0-2.9	0.5-1.0	.37	.37			
	47-64	---	---	10-27	1.35-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.37	.37			
	64-80	---	---	10-25	1.35-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.37	.37			
MagB:														
Madge-----	0-11	---	---	15-25	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	11-15	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	0.0-2.9	0.5-2.0	.37	.37			
	15-22	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	0.0-2.9	0.5-1.0	.37	.37			
	22-42	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	0.0-2.9	0.2-0.8	.37	.37			
	42-70	---	---	18-35	1.30-1.70	0.6-2	0.12-0.20	0.0-2.9	0.2-0.8	.37	.37			
	70-80	---	---	10-27	1.35-1.70	0.6-6	0.11-0.20	0.0-2.9	0.0-0.5	.37	.37			
MngA:														
Mangum-----	0-7	---	---	28-40	1.30-1.50	0.2-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.37	.37	5	4	86
	7-21	---	---	35-60	1.30-1.70	0.0015-0.06	0.12-0.20	6.0-8.9	1.0-2.0	.37	.37			
	21-80	0-45	0-65	30-55	1.30-1.70	0.0015-0.2	0.12-0.20	3.0-8.9	0.5-1.0	.37	.37			
NipA:														
Nipsum-----	0-10	---	---	35-40	1.25-1.50	0.06-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.32	.32	5	4	86
	10-30	---	---	35-45	1.30-1.65	0.06-0.2	0.13-0.20	3.0-5.9	1.0-3.0	.32	.32			
	30-45	---	---	35-55	1.30-1.75	0.06-0.2	0.10-0.18	3.0-5.9	0.5-2.0	.32	.32			
	45-80	---	---	28-55	1.30-1.75	0.06-0.6	0.10-0.18	3.0-5.9	0.5-2.0	.32	.32			
NOTCOM: Area not surveyed, access denied.														
OakA:														
Oakley-----	0-12	---	---	15-25	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-2.0	.37	.37	4	4L	86
	12-43	---	---	20-35	1.30-1.70	0.2-2	0.14-0.20	0.0-2.9	0.1-0.5	.32	.32			
	43-58	---	---	20-35	1.30-1.70	0.2-2	0.14-0.20	0.0-2.9	0.1-0.5	.32	.32			
	58-85	---	---	5-30	1.30-1.70	0.6-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	85-95	---	---	5-30	1.30-1.70	0.6-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	95-100	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
OakB:														
Oakley-----	0-7	---	---	15-25	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-2.0	.37	.37	4	4L	86
	7-41	---	---	20-35	1.30-1.70	0.2-2	0.14-0.20	0.0-2.9	0.1-0.5	.32	.32			
	41-49	---	---	20-35	1.30-1.70	0.2-2	0.14-0.20	0.0-2.9	0.1-0.5	.32	.32			
	49-72	---	---	5-30	1.30-1.70	0.6-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	72-95	---	---	5-30	1.30-1.70	0.6-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	95-100	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
OzkA:														
Ozark-----	0-11	---	---	8-20	1.40-1.65	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	11-24	---	---	20-35	1.30-1.70	0.2-2	0.10-0.20	0.0-2.9	0.5-2.0	.32	.32			
	24-59	---	---	20-35	1.30-1.70	0.2-2	0.10-0.20	0.0-2.9	0.2-1.0	.32	.32			
	59-83	---	---	8-35	1.30-1.70	0.2-6	0.10-0.20	0.0-2.9	0.1-0.5	.32	.32			
	83-105	---	---	30-50	1.30-1.70	0.06-0.6	0.10-0.22	3.0-8.9	0.0-0.3	.32	.32			
	105-110	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
OzsA:														
Ozark-----	0-14	---	---	8-20	1.40-1.65	2-6	0.10-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	14-25	---	---	20-35	1.30-1.70	0.2-2	0.10-0.20	0.0-2.9	0.5-2.0	.32	.32			
	25-50	---	---	20-35	1.30-1.70	0.2-2	0.10-0.20	0.0-2.9	0.2-1.0	.32	.32			
	50-73	---	---	8-35	1.30-1.70	0.2-6	0.10-0.20	0.0-2.9	0.1-0.5	.32	.32			
	73-100	---	---	8-35	1.30-1.70	0.2-6	0.10-0.20	0.0-2.9	0.1-0.5	.32	.32			
	100-110	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
PIT:														
Pits-----	0-80	---	---	---	1.85-2.35	0.0000-0.2	---	---	---	---	---	--	---	---
RakA:														
Roark-----	0-10	---	---	15-27	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	10-24	---	---	35-45	1.30-1.70	0.06-0.2	0.14-0.22	3.0-5.9	1.0-2.0	.37	.37			
	24-34	---	---	35-45	1.30-1.70	0.06-0.6	0.14-0.22	3.0-5.9	0.5-1.0	.37	.37			
	34-49	---	---	35-45	1.30-1.70	0.06-0.6	0.14-0.22	3.0-5.9	0.5-1.0	.37	.37			
	49-67	---	---	15-35	1.30-1.70	0.2-2	0.13-0.22	0.0-5.9	0.2-1.0	.32	.32			
	67-80	---	---	5-40	1.30-1.70	0.2-6	0.06-0.18	0.0-5.9	0.0-0.5	.32	.32			
RKBG:														
Rock outcrop-----	0-60	---	---	---	1.85-2.35	0.0000-0.0015	---	---	---	---	---	--	---	---
Brico-----	0-11	---	---	15-27	1.30-1.55	0.6-2	0.11-0.20	0.0-2.9	1.0-3.0	.15	.37	4	8	0
	11-24	---	---	35-60	1.35-1.60	0.2-0.6	0.04-0.13	3.0-5.9	0.5-1.0	.24	.32			
	24-40	---	---	35-60	1.35-1.60	0.2-0.6	0.04-0.13	3.0-5.9	0.5-1.0	.24	.32			
	40-72	---	---	27-35	1.45-1.70	0.2-0.6	0.04-0.13	3.0-5.9	0.0-0.5	.28	.32			
RKO:														
Rock outcrop-----	0-60	---	---	---	1.85-2.35	0.0000-0.0015	---	---	---	---	---	--	---	---

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
RuuA:														
Rups-----	0-7	---	---	27-35	1.30-1.55	0.2-2	0.08-0.20	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	7-21	---	---	25-35	1.30-1.70	0.2-2	0.02-0.18	3.0-5.9	0.1-1.0	.32	.32			
	21-43	---	---	25-35	1.30-1.70	0.2-2	0.02-0.18	3.0-5.9	0.1-1.0	.32	.32			
	43-80	---	---	27-45	1.30-1.70	0.06-0.6	0.02-0.18	3.0-5.9	0.1-1.0	.32	.32			
RuwA:														
Rups-----	0-15	---	---	27-35	1.30-1.55	0.2-2	0.08-0.20	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	15-48	---	---	25-35	1.30-1.70	0.2-2	0.02-0.18	3.0-5.9	0.1-1.0	.32	.32			
	48-80	0-45	0-65	27-45	1.30-1.70	0.06-0.6	0.02-0.18	3.0-5.9	0.1-1.0	.32	.32			
SkCC2:														
Spikebox-----	0-6	---	---	8-20	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.2-1.0	.24	.24	1	3	86
	6-13	---	---	8-20	1.30-1.70	0.6-6	0.10-0.19	0.0-2.9	0.2-0.8	.32	.37			
	13-40	---	---	---	1.85-2.35	0.2-0.6	---	---	---	---	---			
Cobb-----	0-7	---	---	6-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.5-2.0	.24	.24	3	3	86
	7-28	---	---	18-35	1.30-1.70	0.6-2	0.13-0.19	0.0-2.9	0.0-0.8	.32	.32			
	28-39	---	---	10-35	1.30-1.70	0.6-6	0.10-0.19	0.0-2.9	0.0-0.5	.32	.32			
	39-80	---	---	---	1.85-2.35	0.2-0.6	---	---	---	---	---			
SpDB:														
Springer-----	0-13	70-90	0-28	2-10	1.45-1.65	6-20	0.04-0.10	0.0-2.9	0.2-1.0	.17	.17	5	2	134
	13-42	50-80	2-40	6-18	1.40-1.70	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.20	.20			
	42-57	70-95	0-28	2-12	1.50-1.75	6-20	0.02-0.10	0.0-2.9	0.1-0.5	.20	.20			
	57-80	50-80	0-40	10-25	1.40-1.70	0.6-6	0.10-0.16	0.0-2.9	0.1-0.5	.24	.24			
Devol-----	0-14	75-95	0-22	2-8	1.45-1.70	6-20	0.07-0.11	0.0-2.9	0.2-1.0	.17	.17	5	2	134
	14-29	55-85	0-37	8-18	1.40-1.70	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.20			
	29-45	55-90	0-43	2-18	1.40-1.70	2-20	0.07-0.15	0.0-2.9	0.0-0.5	.20	.20			
	45-65	55-95	0-43	2-10	1.50-1.75	2-20	0.05-0.12	0.0-2.9	0.0-0.2	.20	.20			
	65-80	55-95	0-43	2-10	1.50-1.75	2-20	0.05-0.12	0.0-2.9	0.0-0.2	.17	.17			
SurA:														
Spur-----	0-14	---	---	27-35	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	14-30	---	---	20-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	30-51	---	---	20-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	51-80	15-80	0-53	15-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
SuuA:														
Spur-----	0-10	---	---	27-35	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	10-16	---	---	20-35	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.37	.37			
	16-48	---	---	20-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	48-80	---	---	15-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
SuWA:														
Spur-----	0-8	---	---	27-35	1.30-1.55	0.6-2	0.14-0.20	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	8-17	---	---	20-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	17-35	---	---	20-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	35-49	---	---	20-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
	49-80	0-53	20-80	15-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32			
TARD:														
Talpa-----	0-7	---	---	20-27	1.30-1.55	0.6-2	0.13-0.19	0.0-2.9	1.0-3.0	.32	.37	1	4L	86
	7-40	---	---	---	1.85-2.35	0.0000-0.06	---	---	---	---	---			
Aspermont-----	0-10	---	---	18-27	1.25-1.55	0.6-2	0.15-0.24	1.0-5.9	0.5-2.0	.37	.37	4	4L	86
	10-42	---	---	20-35	1.30-1.70	0.2-2	0.12-0.22	3.0-5.9	0.0-0.5	.37	.37			
	42-80	---	---	27-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
Rock outcrop-----	0-60	---	---	---	1.85-2.35	0.0000-0.06	---	---	---	---	---	--	---	---
TilA:														
Tillman-----	0-8	---	---	27-35	1.30-1.55	0.2-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	8-15	---	---	35-50	1.30-1.65	0.06-0.2	0.12-0.20	6.0-8.9	1.0-2.0	.37	.37			
	15-45	---	---	35-50	1.30-1.70	0.06-0.2	0.10-0.17	6.0-8.9	0.1-0.5	.37	.37			
	45-62	---	---	35-50	1.30-1.70	0.06-0.2	0.10-0.17	6.0-8.9	0.1-0.5	.37	.37			
	62-78	---	---	35-60	1.30-1.70	0.0015-0.2	0.02-0.09	6.0-8.9	0.1-0.5	.37	.37			
	78-90	---	---	40-60	1.30-1.75	0.0015-0.2	0.02-0.09	6.0-8.9	0.0-0.3	.37	.37			
	90-100	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
TilB:														
Tillman-----	0-6	---	---	27-35	1.30-1.55	0.2-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	6-10	---	---	35-50	1.30-1.65	0.06-0.2	0.12-0.20	6.0-8.9	1.0-2.0	.37	.37			
	10-25	---	---	35-50	1.30-1.70	0.06-0.2	0.10-0.18	6.0-8.9	0.1-0.5	.37	.37			
	25-48	---	---	35-50	1.30-1.70	0.06-0.2	0.10-0.17	6.0-8.9	0.1-0.5	.37	.37			
	48-60	---	---	35-50	1.30-1.70	0.06-0.2	0.10-0.17	6.0-8.9	0.1-0.5	.37	.37			
	60-82	---	---	35-60	1.30-1.70	0.06-0.2	0.02-0.09	6.0-8.9	0.1-0.5	.37	.37			
	82-90	---	---	40-60	1.30-1.75	0.0015-0.2	0.02-0.09	6.0-8.9	0.0-0.3	.37	.37			
	90-100	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
TipA:														
Tipton-----	0-8	---	---	15-25	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37	5	5	56
	8-15	---	---	15-25	1.30-1.55	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37			
	15-25	---	---	20-35	1.30-1.70	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.32	.32			
	25-41	---	---	20-35	1.30-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32			
	41-66	---	---	15-35	1.30-1.70	0.6-2	0.15-0.20	0.0-2.9	0.2-0.8	.32	.32			
	66-80	---	---	10-35	1.30-1.70	0.6-6	0.10-0.20	0.0-2.9	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
TlvB:														
Tilvern-----	0-5	---	---	35-40	1.30-1.55	0.2-0.6	0.12-0.18	3.0-5.9	0.5-2.0	.43	.43	4	4	86
	5-11	---	---	35-55	1.30-1.65	0.06-0.2	0.10-0.18	6.0-8.9	0.5-1.0	.37	.37			
	11-31	---	---	40-55	1.30-1.65	0.0015-0.06	0.10-0.17	6.0-8.9	0.0-0.5	.37	.37			
	31-44	---	---	35-55	1.30-1.70	0.0015-0.2	0.10-0.18	6.0-8.9	0.0-0.5	.37	.37			
	44-51	---	---	35-55	1.30-1.70	0.0015-0.2	0.10-0.18	6.0-8.9	0.0-0.5	.37	.37			
	51-80	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
TpFA:														
Tipton-----	0-7	---	---	10-18	1.40-1.65	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	7-13	---	---	10-18	1.40-1.65	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24			
	13-24	---	---	15-25	1.30-1.60	0.6-2	0.15-0.20	0.0-2.9	1.0-2.0	.37	.37			
	24-47	---	---	20-35	1.30-1.70	0.6-2	0.15-0.20	0.0-2.9	0.5-1.5	.32	.32			
	47-63	---	---	20-35	1.30-1.70	0.6-2	0.14-0.20	0.0-2.9	0.2-1.0	.32	.32			
	63-80	---	---	10-35	1.35-1.70	0.6-6	0.10-0.20	0.0-2.9	0.0-0.5	.32	.32			
TrwB:														
Treadway-----	0-7	---	---	30-40	1.40-1.60	0.06-0.2	0.12-0.18	3.0-5.9	0.0-0.5	.43	.43	5	4L	86
	7-20	---	---	35-60	1.35-1.70	0.0015-0.06	0.08-0.18	3.0-8.9	0.0-0.5	.37	.37			
	20-64	---	---	35-60	1.35-1.70	0.0015-0.06	0.08-0.18	3.0-8.9	0.0-0.5	.37	.37			
	64-80	---	---	35-60	1.35-1.70	0.0015-0.06	0.05-0.18	3.0-8.9	0.0-0.5	.37	.37			
UST:														
Ustorthents-----	0-60	---	---	---	1.60-2.00	0.0015-2	---	---	---	---	---	1	8	0
VeKE:														
Vernon-----	0-6	---	---	35-40	1.30-1.55	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.43	.43	3	4	86
	6-26	---	---	40-60	1.35-1.60	0.0015-0.06	0.10-0.18	6.0-8.9	0.1-1.0	.37	.37			
	26-80	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
Knoco-----	0-6	---	---	40-60	1.35-1.55	0.0015-0.06	0.10-0.17	1.0-4.0	0.5-1.0	.32	.37	1	4	86
	6-16	---	---	40-60	1.45-1.70	0.0015-0.06	0.03-0.10	1.0-4.0	0.0-0.5	.32	.32			
	16-60	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
VerC:														
Vernon-----	0-6	---	---	35-40	1.30-1.55	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.43	.43	3	4	86
	6-26	---	---	40-60	1.35-1.60	0.0015-0.06	0.10-0.18	6.0-8.9	0.1-1.0	.37	.37			
	26-35	---	---	40-60	1.35-1.60	0.0015-0.06	0.10-0.18	6.0-8.9	0.1-1.0	.37	.37			
	35-80	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
VeTE:														
Vernon-----	0-7	---	---	35-40	1.30-1.55	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.43	.43	3	4	86
	7-16	---	---	40-60	1.35-1.60	0.0015-0.06	0.10-0.18	6.0-8.9	0.1-1.0	.37	.37			
	16-25	---	---	40-60	1.35-1.60	0.0015-0.06	0.10-0.18	6.0-8.9	0.1-1.0	.37	.37			
	25-38	---	---	40-60	1.35-1.75	0.0015-0.06	0.06-0.10	6.0-8.9	0.1-1.0	.37	.37			
	38-80	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
VeTE: Talpa-----	0-9	---	---	20-27	1.30-1.55	0.6-2	0.13-0.19	0.0-2.9	1.0-3.0	.32	.37	1	4L	86
	9-40	---	---	---	1.85-2.35	0.0000-0.06	---	---	---	---	---			
W: Water.														
WodB: Woods-----	0-8	---	---	27-40	1.30-1.60	0.2-0.6	0.15-0.22	3.0-5.9	1.0-5.0	.43	.43	5	4L	86
	8-15	---	---	35-60	1.35-1.60	0.0015-0.06	0.14-0.22	6.0-8.9	1.0-2.0	.37	.37			
	15-33	---	---	35-60	1.35-1.60	0.0015-0.06	0.14-0.22	6.0-8.9	0.5-1.0	.37	.37			
	33-49	---	---	27-60	1.35-1.70	0.0015-0.2	0.15-0.22	6.0-8.9	0.2-0.8	.37	.37			
	49-64	---	---	27-60	1.35-1.70	0.06-0.6	0.15-0.22	6.0-8.9	0.2-0.8	.37	.37			
	64-80	---	---	18-60	1.30-1.70	0.06-0.6	0.15-0.24	6.0-8.9	0.2-0.8	.37	.37			
WslA: Westola-----	0-12	---	---	10-18	1.40-1.65	2-6	0.11-0.18	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	12-50	32-85	0-50	5-18	1.30-1.70	2-6	0.10-0.20	0.0-2.9	0.0-0.5	.32	.32			
	50-80	32-100	0-50	5-18	1.30-1.70	2-20	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
WstA: Westola-----	0-8	---	---	10-18	1.40-1.65	2-6	0.11-0.17	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	8-19	---	---	10-18	1.35-1.60	0.6-2	0.13-0.19	0.0-2.9	0.5-1.0	.32	.32			
	19-30	40-80	---	5-18	1.30-1.70	2-6	0.10-0.20	0.0-2.9	0.0-0.5	.28	.28			
	30-80	32-100	0-50	5-18	1.30-1.70	2-6	0.10-0.20	0.0-2.9	0.0-0.5	.28	.28			
WtlA: Westill-----	0-5	---	---	27-35	1.30-1.55	0.2-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	5-15	---	---	35-50	1.30-1.65	0.0015-0.06	0.12-0.20	6.0-8.9	1.0-2.0	.37	.37			
	15-24	---	---	35-50	1.30-1.65	0.0015-0.06	0.12-0.20	6.0-8.9	0.2-1.0	.37	.37			
	24-55	---	---	35-60	1.30-1.70	0.0015-0.06	0.10-0.17	6.0-8.9	0.1-0.5	.37	.37			
	55-70	---	---	40-60	1.30-1.75	0.0000-0.06	0.02-0.15	6.0-8.9	0.0-0.3	.37	.37			
	70-80	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
WtlB: Westill-----	0-9	---	---	27-35	1.30-1.55	0.2-0.6	0.15-0.20	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	9-16	---	---	35-50	1.30-1.65	0.0015-0.06	0.12-0.20	6.0-8.9	1.0-2.0	.37	.37			
	16-47	---	---	35-60	1.30-1.70	0.0015-0.06	0.10-0.17	6.0-8.9	0.1-0.5	.37	.37			
	47-56	---	---	35-60	1.30-1.70	0.0015-0.06	0.02-0.15	6.0-8.9	0.1-0.5	.37	.37			
	56-68	---	---	40-60	1.30-1.75	0.0000-0.06	0.02-0.15	6.0-8.9	0.0-0.3	.37	.37			
	68-80	---	---	40-60	1.70-2.25	0.0000-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			

Physical Analyses of Selected Soils

(The symbol < means less than. TR means trace. Dashes indicate that analyses were not made.)

Soil name and sample number ¹			Particle-size distribution										Bulk density		Water reten- tion differ- ence	Water content		COLE
				Silt			Sand											
				Clay (<0.002)	TOTAL	Fine	Coarse	TOTAL	Very	Fine	Medium	Coarse						
					SILT (0.002- 0.05mm)	(0.002- 0.02mm)	(0.02- 0.05mm)	SAND (0.05- 2.0mm)	fine (0.05- 0.10mm)	(0.10- 0.25mm)	(0.25- 0.50mm)	(0.5- 1mm)	(2.0- 1.0mm)					
Horizon	Depth																	
		In	-----Pct-----										g/cm ³	g/cm ³	cm/cm	-----Pct----		
Arnett S97OK-065-001	Ap	0-7	15.8	25.4	5.8	19.6	58.8	13.2	11.5	22.1	9.0	3.0	1.49	1.57	0.08	12.3	6.9	.016
	Bt1	7-11	34.5	30.3	8.0	22.3	35.2	12.0	7.4	8.6	5.9	1.3	1.46	1.71	0.11	21.0	13.6	.054
	Bt2	11-17	33.0	28.0	7.5	20.5	39.0	11.0	6.1	8.3	9.5	4.1	1.56	1.77	0.08	18.0	12.6	.041
	2Bt3	17-31	25.3	16.5	4.0	12.5	58.2	9.4	6.8	10.9	15.1	16.0	1.66	1.75	0.03	12.3	9.7	.012
	2BC	31-44	16.1	15.7	5.1	10.6	68.2	9.3	7.6	18.0	18.5	14.8	1.59	1.69	0.08	13.4	6.5	.015
	2C1	44-57	9.9	13.4	4.9	8.5	76.7	6.1	3.9	13.8	32.1	20.8	---	---	---	---	4.5	---
	3C2	57-84	17.0	45.7	12.2	33.5	37.3	24.7	5.2	4.9	1.7	0.8	---	---	---	---	6.9	---
	3C3	84-99	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.3	---
Aspermont S97OK-065-004	Ap	0-6	25.0	54.7	15.3	39.4	20.3	14.3	2.6	1.4	1.1	0.9	---	---	---	---	10.1	---
	Bk1	6-23	27.8	53.1	21.9	31.2	19.1	10.0	2.6	2.0	2.1	2.4	1.36	1.49	0.12	20.7	11.6	.029
	Bk2	23-34	28.9	51.1	17.6	33.5	20.0	14.2	2.9	1.5	0.9	0.5	1.41	1.58	0.12	21.0	12.4	.037
	Bk3	34-43	38.5	42.6	17.2	25.5	18.9	11.9	2.8	1.6	1.4	1.2	1.46	1.70	0.10	23.5	15.8	.047
	BC	43-50	32.8	47.9	29.3	18.6	19.3	8.7	3.6	2.4	2.2	2.4	1.38	1.61	0.15	25.5	12.2	.041
	C1	50-68	18.6	61.7	51.6	10.1	19.7	5.8	5.0	4.2	2.9	1.8	---	---	---	---	7.7	---
	C2	68-91	27.9	52.5	21.8	30.7	19.6	14.4	2.1	1.4	1.1	0.6	1.51	1.67	0.12	23.3	13.7	.027
Decobb ² S96OK-065-004	Ap	0-5	15.9	40.5	11.8	28.7	44.5	24.1	19.8	0.5	0.1	---	1.60	1.67	0.17	16.4	5.8	.014
	A	5-18	19.5	27.6	10.0	17.6	52.9	24.9	27.4	0.5	0.1	---	1.48	1.56	0.11	14.2	7.1	.018
	BA	18-22	22.4	22.7	8.7	14.0	54.9	27.4	26.8	0.6	0.1	TR	1.47	1.57	0.09	14.2	8.0	.022
	Bt1	22-36	26.9	21.6	7.8	13.8	51.5	24.4	26.4	0.6	0.1	TR	1.52	1.62	0.08	14.2	9.1	.021
	Bt2	36-50	22.8	19.0	7.4	11.6	58.2	28.5	29.2	0.4	0.1	TR	1.49	1.58	0.07	12.9	7.9	.020
	BC	50-59	21.3	18.7	8.1	10.6	60.0	30.6	29.0	0.4	TR	TR	1.41	1.49	0.07	12.4	7.3	.019
	BCK	59-62	14.9	17.6	10.6	7.0	67.5	37.2	27.9	1.6	0.6	0.2	---	---	---	---	5.2	-----
	2Cr	62-79	5.8	8.7	5.0	3.7	85.5	35.0	49.5	0.4	0.2	0.4	1.79	1.81	0.16	11.8	2.8	.004
Eastall S98OK-065-003	Ap	0-5	55.3	40.8	25.9	14.9	3.9	3.2	0.4	0.2	0.1	TR	1.19	1.63	0.20	37.5	20.7	.111
	A	5-12	55.9	40.5	24.9	15.6	3.6	3.1	0.3	0.2	TR	TR	1.27	1.73	0.16	34.3	21.9	.109
	Bw	12-19	51.0	44.0	20.2	23.8	5.0	4.1	0.5	0.2	0.1	0.1	1.29	1.76	0.16	33.7	21.6	.109
	Bss1	19-39	51.5	43.2	20.8	22.4	5.3	4.4	0.5	0.2	0.1	0.1	1.33	1.79	0.15	32.4	21.2	.104
	Bss2	39-56	49.8	44.4	21.8	22.7	5.8	4.4	0.5	0.3	0.3	0.3	1.31	1.71	0.17	33.6	20.4	.092
	Bss3	56-76	47.9	46.1	21.9	24.2	6.0	4.9	0.5	0.3	0.2	0.1	1.36	1.71	0.14	30.8	20.6	.079
	Bssk	76-95	44.1	48.3	23.6	24.7	7.6	5.8	0.7	0.3	0.4	0.4	1.38	1.70	0.15	29.2	18.6	.072

See footnotes at end of table.

Physical Analyses of Selected Soils--Continued

Soil name and sample number ¹	Hori- zon	Depth	Particle-size distribution										Bulk density		Water reten- tion differ- ence	Water content		COLE
			Clay (<0.002)	Silt			Sand						1/3 bar	Oven- dry	1/3 bar 15 bar	1/3 bar 15 bar		
				TOTAL SILT (0.002- 0.05mm)	Fine (0.002- 0.02mm)	Coarse (0.02- 0.05mm)	TOTAL SAND (0.05- 2.0mm)	Very fine (0.05- 0.10mm)	Fine (0.10- 0.25mm)	Medium (0.25- 0.50mm)	Coarse (0.5- 1mm)	Very coarse (2.0- 1.0mm)						
In			Pct										g/cm ³	g/cm ³	cm/cm	Pct		
Hardeman S97OK-065-006	Ap	0-6	6.6	29.6	3.7	25.9	63.8	28.0	23.7	11.5	0.6	---	1.51	1.54	0.18	15.1	3.2	.007
	Bw1	6-17	14.0	39.7	6.8	32.9	46.3	24.0	15.4	6.5	0.4	---	1.50	1.57	0.17	18.0	6.4	.015
	Bw2	17-31	15.3	46.9	9.6	37.3	37.8	22.8	10.1	4.5	0.4	TR	1.36	1.44	0.18	19.9	6.7	.019
	Bw3	31-46	18.0	43.9	9.6	34.3	38.1	20.7	10.5	6.7	0.2	TR	1.45	1.55	0.18	19.5	7.2	.022
	Bk	46-66	15.8	33.3	8.4	24.9	50.9	16.7	18.5	14.2	1.3	0.2	1.59	1.66	0.16	16.4	6.5	.014
	Bk	66-86	14.7	26.7	6.1	20.6	58.6	14.3	23.6	18.3	2.0	0.4	1.63	1.68	0.10	11.9	6.0	.010
	Bk	86- 119	11.2	23.1	4.2	18.9	65.7	18.1	26.6	19.6	1.4	TR	---	---	---	---	4.6	---
	2Bck	119- 131	28.7	44.5	24.4	20.1	26.8	13.0	6.5	5.5	1.0	0.8	---	---	---	---	10.3	---
Harmon S97OK-065-009	Ap	0-7	14.8	58.7	35.5	23.3	26.5	11.0	4.2	4.0	4.6	2.7	---	---	---	---	6.6	---
	ACk	7-16	13.1	65.1	52.2	12.9	21.8	5.5	4.1	4.0	5.1	3.1	---	---	---	---	6.5	---
Headrick ³ S96OK-065-001	Ap	0-14	4.9	6.4	0.8	5.6	88.7	10.9	37.2	36.5	4.1	TR	1.76	1.79	0.08	6.7	2.1	.006
	Bt1	14-21	21.5	11.8	2.4	9.4	66.7	13.5	26.2	24.6	2.4	TR	1.62	1.77	0.11	16.4	9.5	.030
	Bt2	21-29	17.0	14.4	2.6	11.8	68.6	21.4	22.5	21.8	2.9	TR	1.64	1.75	0.12	14.3	6.9	.022
	Bt3	29-51	19.2	21.3	5.3	16.0	59.5	16.3	22.0	18.8	2.3	0.1	1.78	1.90	0.11	13.9	7.7	.022
	Bt4	51-66	23.3	18.4	5.3	13.1	58.3	14.5	23.2	18.2	1.9	0.5	1.77	1.89	0.09	14.2	9.0	.022
	2Bck	66-71	38.3	39.7	28.5	11.2	22.0	5.9	7.6	6.2	1.2	1.1	1.81	2.02	0.06	17.0	13.7	.036
Hollister ⁴ S96OK-065-006	Ap	0-7	39.6	48.3	18.8	29.5	12.1	10.3	1.1	0.4	0.1	0.2	1.33	1.58	0.13	25.9	16.2	.059
	Bw	7-14	46.2	41.5	19.9	21.6	12.3	8.9	1.5	0.6	0.5	0.8	1.49	1.81	0.10	24.6	17.8	.066
	Bss1	14-31	45.5	41.7	20.3	21.4	12.8	8.4	1.8	0.9	1.0	0.7	1.53	1.85	0.09	23.7	17.6	.061
	Bss2	31-39	45.1	41.5	20.4	21.1	13.4	8.3	1.7	1.1	0.9	1.4	1.54	1.92	0.10	24.3	17.8	.076
	Bss3	39-56	46.7	41.0	21.2	19.8	12.3	9.9	0.2	0.8	0.7	0.7	1.47	1.90	0.14	27.2	17.9	.089
	Bss4	56-72	45.9	40.2	19.8	20.4	13.9	10.3	2.0	0.7	0.6	0.3	1.56	1.84	0.11	23.5	16.6	.056
	Bk	72-80	42.1	43.2	25.3	17.9	14.7	10.1	2.2	1.0	0.6	0.8	---	---	---	---	14.7	---
	Bck	80- 110	40.8	39.7	22.7	17.0	19.5	12.2	3.4	2.0	0.9	1.0	---	---	---	---	15.3	---
		2C	110- 138	44.9	35.4	24.3	11.1	19.7	8.9	2.2	2.7	2.7	3.2	---	---	---	---	16.4
Hollister satellite	Ap	0-9	38.0	49.1	19.7	29.4	12.9	10.4	1.6	0.5	0.2	0.2	---	---	---	---	15.3	---
	Bw	9-23	43.8	44.4	18.7	25.7	11.8	9.6	1.5	0.4	0.2	0.1	---	---	---	---	18.0	---
	Bss1	23-33	44.0	43.8	19.0	24.8	12.2	8.5	1.5	0.9	0.5	0.8	---	---	---	---	17.2	---

See footnotes at end of table.

Physical Analyses of Selected Soils--Continued

Soil name and sample number ¹	Hori- zon	Depth	Particle-size distribution										Bulk density		Water reten- tion differ- ence	Water content		COLE
			Clay (<0.002)	Silt		Sand												
				TOTAL SILT (0.002- 0.05mm)	Fine (0.002- 0.02mm)	Coarse (0.02- 0.05mm)	TOTAL SAND (0.05- 2.0mm)	Very fine (0.05- 0.10mm)	Fine (0.10- 0.25mm)	Medium (0.25- 0.50mm)	Coarse (0.5- 1mm)	Very coarse (2.0- 1.0mm)	1/3 bar	Oven- dry	1/3 bar 15 bar	1/3 bar	15 bar	
In			-----Pct-----										g/cm ³	g/cm ³	cm/cm	----Pct----		
La Casa S97OK-065-002	Ap	0-6	31.1	56.5	15.4	41.1	12.4	10.1	1.5	0.5	0.2	0.1	1.18	1.36	---	34.7	12.3	.048
	Bt1	6-12	38.7	48.3	15.2	33.1	13.0	9.7	1.6	0.6	0.4	0.7	1.48	1.73	0.13	24.5	15.4	.053
	Bt2	12-24	39.7	46.7	16.8	29.9	13.6	9.3	1.5	0.6	0.7	1.5	1.50	1.79	0.14	24.8	15.4	.059
	Bt2	24-34	41.2	47.7	16.3	31.4	11.1	8.3	1.1	0.5	0.5	0.7	1.53	1.79	0.12	23.1	15.5	.053
	Btk1	34-47	31.2	55.1	28.0	27.1	13.7	6.6	1.9	1.7	2.0	1.5	1.54	1.73	0.11	19.9	11.5	.033
	Btk2	47-64	34.2	52.7	27.3	25.4	13.1	7.3	1.9	1.5	1.4	1.0	1.63	1.86	0.11	20.1	13.0	.041
	BCK	64-81	37.0	52.3	27.5	24.8	10.7	7.8	1.7	0.6	0.4	0.2	1.55	1.81	0.12	22.8	14.0	.051
	C	81-90	35.7	55.2	36.7	18.5	9.1	3.4	0.8	1.1	1.8	2.0	1.41	1.69	0.20	28.3	14.4	.062
Oakley S97OK-065-005	Ap	0-7	20.4	34.6	10.2	24.4	45.0	13.9	11.8	14.2	3.8	1.3	1.72	1.84	0.14	16.4	8.4	.022
	A	7-12	20.7	34.5	9.9	24.6	44.8	15.8	12.3	13.6	2.5	0.6	1.64	1.78	0.14	16.9	8.3	.027
	Bk1	12-21	26.3	41.7	25.6	16.1	32.0	8.9	8.5	10.2	3.0	1.4	1.66	1.78	0.09	15.7	10.0	.023
	Bk1	21-30	24.8	46.4	28.5	17.9	28.8	7.5	6.9	9.0	2.9	2.5	1.70	1.81	0.08	14.7	10.0	.020
	Bk2	30-43	22.7	47.7	26.5	21.2	29.6	10.2	7.2	5.4	3.4	3.4	1.78	1.85	0.06	13.6	9.7	.012
	Bk3	43-58	21.9	35.6	17.4	18.2	42.5	18.1	16.7	4.9	1.6	1.2	1.86	1.94	0.06	13.0	9.5	.012
	BC	58-85	22.0	22.6	10.4	12.2	55.4	17.4	25.5	11.1	0.8	0.6	---	---	---	---	9.3	---
Ozark ⁵ S96OK-065-002	Ap	0-11	14.8	22.5	5.2	17.3	62.7	15.3	20.6	22.1	4.1	0.6	1.76	1.85	0.11	12.2	5.9	.017
	Bt	11-24	29.3	22.5	8.1	14.8	47.8	12.3	14.5	17.0	3.9	0.1	1.72	1.88	0.08	15.7	10.9	.030
	Btk1	24-39	38.6	30.3	18.7	11.6	31.1	8.7	11.8	8.9	1.4	0.3	1.69	1.92	0.07	18.4	14.3	.043
	Btk2	39-50	27.3	27.4	10.3	17.1	45.3	10.8	15.9	15.1	3.0	0.5	1.71	1.86	0.09	15.9	10.5	.028
	Btk3	50-61	27.1	30.8	12.8	18.0	42.1	13.8	16.1	9.9	2.0	0.3	1.71	1.83	0.09	15.9	10.9	.023
	BC	61-83	19.7	15.3	5.8	9.5	65.0	11.1	29.2	21.6	2.8	0.3	1.70	1.75	0.04	9.8	9.8	.010
Tillman ⁶ S96OK-065-003	Ap	0-6	22.0	54.5	13.0	41.5	23.5	18.0	3.4	1.7	0.3	0.1	1.44	1.59	0.17	21.6	9.8	.033
	Bt1	6-17	42.5	44.1	16.9	27.3	13.4	10.5	1.8	0.8	0.2	0.1	1.42	1.82	0.14	27.1	17.4	.086
	Bt2	17-30	41.3	45.2	20.3	24.9	13.5	9.4	1.6	1.0	0.6	0.9	1.50	1.87	0.12	24.4	16.6	.075
	Btk1	30-42	40.4	45.2	21.0	24.2	14.4	8.6	1.9	1.4	0.8	1.7	1.47	1.88	0.13	26.8	17.2	.078
	Btk2	42-50	43.0	43.4	19.7	23.7	13.6	8.9	1.6	1.2	0.8	1.1	1.45	1.88	0.15	28.3	18.1	.089
	Btky	50-61	46.0	40.2	19.3	20.9	13.8	9.8	2.0	1.2	0.4	0.4	1.43	1.82	0.14	28.9	18.9	.079
	Bk	61-74	42.7	44.9	32.6	12.3	12.4	6.2	2.1	1.6	1.3	1.2	1.65	1.84	0.07	19.3	14.5	.034
	BCK	74-84	39.5	48.4	34.5	13.9	12.1	6.3	2.5	1.9	0.7	0.7	---	---	---	---	13.9	---
	2Cr	84-92	43.6	44.5	32.4	12.1	11.9	3.8	0.9	1.6	2.8	2.8	1.65	1.97	0.04	18.3	14.9	.029

See footnotes at end of table.

Physical Analyses of Selected Soils--Continued

Soil name and sample number ¹			Particle-size distribution										Bulk density		Water reten- tion differ- ence	Water content		COLE													
				Silt			Sand																								
				Clay (<small><0.002</small>)	TOTAL SILT (<small>0.002-0.05mm</small>)	Fine (<small>0.002-0.02mm</small>)	Coarse (<small>0.02-0.05mm</small>)	TOTAL SAND (<small>0.05-2.0mm</small>)	Very fine (<small>0.05-0.10mm</small>)	Fine (<small>0.10-0.25mm</small>)	Medium (<small>0.25-0.50mm</small>)	Coarse (<small>0.5-1mm</small>)	Very coarse (<small>2.0-1.0mm</small>)																		
														1/3 bar	Oven- dry	1/3 bar 15 bar	1/3 bar		15 bar												
Hori- zon	Depth																														
Tilvern S98OK-065-004	Ap	0-5	37.8	46.8	14.9	31.9	15.4	12.1	1.6	0.7	0.5	0.5	g/cm ³	g/cm ³	cm/cm	----	Pct----														
	Bk1	5-11	44.6	43.9	17.8	26.1	11.5	9.0	1.0	0.4	0.4	0.7	1.50	1.75	0.14	22.6	13.5	.052													
	Bk2	11-23	48.2	41.4	19.1	22.3	10.4	7.0	0.8	0.5	0.8	1.3	1.51	1.84	0.11	23.4	16.2	.067													
	Bssk	23-31	49.6	42.1	21.2	20.9	8.3	6.2	0.9	0.5	0.4	0.3	1.47	1.89	0.10	24.9	17.9	.086													
	Bky	31-44	49.3	44.0	22.7	21.3	6.7	6.1	0.9	0.5	0.4	0.3	1.47	1.88	0.12	26.5	18.2	.085													
	Bcky	44-51	51.5	42.0	22.2	19.9	6.5	5.9	0.6	TR	TR	TR	1.37	1.74	0.16	29.8	18.2	.083													
Westill ⁷ S97OK-057-004	A	0-5	33.7	38.2	13.7	24.5	28.1	13.0	8.0	6.0	0.9	0.2	1.40	1.85	0.15	30.3	19.5	.097													
	Bt1	5-15	42.9	34.0	13.9	20.1	23.1	11.2	6.6	4.4	0.7	0.2	1.17	1.35	0.15	24.7	12.0	.049													
	Bt2	15-24	43.6	38.0	16.1	21.9	18.4	9.2	5.0	3.4	0.4	0.4	1.46	1.70	0.11	22.3	15.0	.052													
	Btk1	24-40	46.7	37.2	18.1	19.1	16.1	7.1	3.8	2.8	1.3	1.1	1.53	1.83	0.11	22.6	15.1	.061													
	Btk2	40-55	44.4	46.0	29.0	17.0	9.6	4.0	2.1	1.6	1.0	0.9	1.57	1.89	0.10	22.2	15.9	.062													
	C	55-79	41.6	53.1	35.1	18.0	5.3	3.5	1.1	0.5	0.1	0.1	1.49	1.85	0.13	26.7	17.6	.072													
																		.050													

¹ Locations of sampled pedons are as follows:

Arnett sandy loam (S97OK-065-001), about 850 feet south and 250 feet west of the northeast corner of sec. 22, T. 1 S., R. 24 W.
 Aspermont silt loam (S97OK-065-004), about 950 feet north and 1,500 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.
 Decobb very fine sandy loam (S96OK-065-004), about 1,800 feet north and 90 east of the southwest corner of sec. 6, T. 1 S., R. 20 W.
 Eastall silty clay (S98OK-065-003), about 2,500 feet north and 2,100 feet west of the southeast corner of sec. 34, T. 1 N., R. 23 W.
 Hardeman fine sandy loam (S97OK-065-006), about 2,650 feet north and 1,500 feet west of the southeast corner of sec. 31, T. 3 N., R. 18 W.
 Harmon very gravelly silt loam (S97OK-065-009), about 550 feet north and 1,350 east of the southwest corner of sec. 22, T. 2 N., R. 23 W.
 Headrick loamy sand (S96OK-065-001), about 775 feet south and 650 west of the northeast corner of sec. 7, T. 3 N., R. 19 W.
 Hollister silty clay loam (S96OK-065-006), about 540 feet north and 2,470 feet east of the southwest corner of sec. 30, T. 1 N., R. 21 W.
 La Casa silty clay loam (S97OK-065-002), about 400 feet north and 500 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.
 Oakley loam (S97OK-065-005), about 450 feet north and 1,100 feet west of the southeast corner of sec. 28, T. 3 N., R. 19 W.
 Ozark fine sandy loam (S96OK-065-002), about 500 feet north and 2,000 feet west of the southeast corner of sec. 29, T. 3 N., R. 19 W.
 Tillman silt loam (S96OK-065-003), about 500 feet north and 1,600 feet west of the southeast corner of sec. 14, T. 2 N., R. 19 W.
 Tilvern silty clay loam (S98OK-065-004), about 1,200 feet north and 2,200 feet east of the southwest corner sec. 24, T. 1 N., R. 23 W.
 Westill clay loam (S97OK-057-004), about 2,150 feet north and 150 feet west of the southeast corner of sec. 4, T. 2 N., R. 25 W.

² The content of organic carbon, by weighted average, in the upper 10 inches of this pedon meets the minimum requirement for a mollic epipedon.³ This pedon is slightly deeper to a lithologic discontinuity than is described as the range for the series.⁴ This pedon of the Hollister series was sampled in a microhigh at the location described in footnote 1, and the satellite sample was taken from the same pit in a microlow about 8 feet to the southeast of the given location. Both pedons appeared identical below a depth of 33 inches.⁵ The content of organic carbon in the upper 10 inches of this pedon does not meet the minimum requirement for a mollic epipedon.⁶ The surface layer of this pedon is silt loam, and that of the Tillman map unit is clay loam.⁷ This pedon was sampled in Harmon County, Oklahoma, and was originally correlated to the Tillman series and map unit 55 in the soil survey of Harmon County published in 1984 (USDA, 1984).

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	<i>In</i>	<i>meq/100 g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
AcmA:							
Acme-----	0-15	7.5-16	7.4-8.4	2-10	0-5	0.0-4.0	0-6
	15-20	11-21	7.4-8.4	2-10	0-10	2.0-10.0	3-12
	20-40	6.5-21	7.9-8.4	2-15	20-60	4.0-16.0	3-12
	40-80	6.5-21	7.9-8.4	2-15	40-90	4.0-16.0	3-12
ArHF:							
Arnett-----	0-15	7.0-13	6.1-7.8	0-1	0	0	0
	15-40	11-21	6.6-8.4	0-10	0	0	0
	40-58	11-21	6.6-8.4	0-10	0	0	0
	58-80	7.0-21	6.6-8.4	0-10	0	0	0
Hardeman-----	0-7	6.7-11	7.4-8.4	0-5	0	0.0-2.0	0
	7-40	7.8-11	7.4-8.4	1-10	0	0.0-2.0	0
	40-60	7.8-11	7.9-8.4	2-15	0	0.0-2.0	0
	60-80	3.8-11	7.9-8.4	2-15	0	0.0-2.0	0
ArnB:							
Arnett-----	0-7	7.0-13	6.1-7.8	0-1	0	0	0
	7-26	11-21	6.6-8.4	0-10	0	0	0
	26-46	7.0-21	6.6-8.4	0-10	0	0	0
	46-80	5.0-21	7.9-8.4	2-15	0	0	0
ArnC:							
Arnett-----	0-7	7.0-13	6.1-7.8	0-1	0	0	0
	7-17	11-21	6.6-8.4	0-10	0	0	0
	17-31	11-21	6.6-8.4	0-10	0	0	0
	31-44	7.0-21	6.6-8.4	0-10	0	0	0
	44-80	5.0-21	7.9-8.4	2-15	0	0	0
AsmB:							
Aspermont-----	0-6	11-22	7.9-8.4	2-10	0-1	0.0-2.0	0-2
	6-34	7.5-24	7.9-8.4	5-20	0-1	0.0-2.0	0-2
	34-43	7.5-24	7.9-8.4	15-40	0-2	0.0-2.0	0-4
	43-50	7.5-24	7.9-8.4	5-25	0-5	0.0-4.0	0-6
	50-80	12-24	7.4-8.4	1-8	0-2	0.0-2.0	0-8
AsmC:							
Aspermont-----	0-8	11-22	7.9-8.4	2-10	0-1	0.0-2.0	0-2
	8-35	7.5-24	7.9-8.4	5-20	0-1	0.0-2.0	0-2
	35-50	7.5-24	7.9-8.4	15-40	0-2	0.0-2.0	0-4
	50-80	12-24	7.4-8.4	1-8	0-2	0.0-2.0	0-8
BekA:							
Beckman-----	0-11	24-35	7.9-8.4	1-5	0-5	0.0-8.0	0-4
	11-44	24-35	7.9-8.4	5-15	2-25	4.0-16.0	2-8
	44-80	24-35	7.9-8.4	5-15	2-25	4.0-16.0	2-8
BfdB:							
Burford-----	0-5	12-16	7.4-8.4	0-5	0	0	0
	5-12	12-22	7.9-8.4	2-15	0	0	0
	12-30	12-22	7.9-8.4	5-20	0	0	0
	30-43	16-30	7.9-8.4	5-15	0-2	0.0-2.0	0
	43-80	12-24	7.4-8.4	1-8	0-2	0.0-2.0	0-8

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
BfdC:							
Burford-----	0-6	12-16	7.4-8.4	0-5	0	0	0
	6-24	12-22	7.9-8.4	5-20	0	0	0
	24-40	16-30	7.9-8.4	5-15	0-2	0.0-2.0	0
	40-80	12-24	7.4-8.4	1-8	0-2	0.0-2.0	0-8
CobB:							
Cobb-----	0-7	4.5-15	6.1-7.3	0	0	0.0-2.0	0
	7-29	11-21	6.1-8.4	0-5	0	0.0-2.0	0
	29-34	6.5-21	6.1-8.4	0-5	0	0.0-2.0	0
	34-80	---	---	---	---	---	---
CVRD:							
Cottonwood-----	0-5	11-17	7.9-8.4	5-30	2-20	0.0-2.0	0-4
	5-8	11-17	7.9-8.4	5-30	40-90	0.0-2.0	0-4
	8-20	---	---	---	---	---	---
Vinson-----	0-4	9.6-17	7.4-8.4	0-10	0-1	0.0-2.0	0
	4-15	11-18	7.9-8.4	2-10	2-10	0.0-2.0	0
	15-22	11-18	7.9-8.4	5-15	2-10	0.0-2.0	0
	22-28	---	---	---	---	---	---
	28-60	---	---	---	---	---	---
Rock outcrop-----	0-60	---	---	---	---	---	---
DAM:							
Dam-----	0-80	---	---	---	---	---	---
DcbB:							
Decobb-----	0-8	3.0-10	6.1-7.3	0	0	0.0-2.0	0
	8-18	3.0-10	6.1-7.3	0	0	0.0-2.0	0
	18-50	10-18	6.1-8.4	0	0	0.0-2.0	0
	50-63	10-18	6.1-8.4	0-10	0	0.0-2.0	0
	63-80	---	---	---	---	---	---
DeSD:							
Devol-----	0-8	2.0-5.5	5.6-7.8	0	0	0	0
	8-28	5.5-11	6.1-8.4	0	0	0	0
	28-47	2.0-11	6.1-8.4	0	0	0	0
	47-62	2.0-6.7	6.6-8.4	0-5	0	0	0
	62-80	2.0-6.7	6.6-8.4	0-5	0	0	0
Springer-----	0-15	2.0-7.0	5.6-7.8	0	0	0.0-1.0	0
	15-41	6.0-12	6.1-8.4	0	0	0.0-1.0	0
	41-52	2.0-8.0	6.6-8.4	0	0	0.0-1.0	0
	52-70	6.0-16	6.6-8.4	0-5	0	0.0-2.0	0
	70-80	2.0-6.7	6.6-8.4	0-5	0	0	0
EatA:							
Eastall-----	0-12	35-50	6.6-8.4	0-2	0	0.0-2.0	0
	12-19	35-50	7.4-8.4	0-2	0	0.0-2.0	0
	19-56	35-50	7.4-8.4	0-5	0	0.0-2.0	0
	56-76	35-50	7.4-8.4	0-5	0	0.0-2.0	0
	76-95	25-50	7.9-8.4	2-15	0-2	0.0-2.0	0
EdsB:							
Eda-----	0-11	1.0-5.0	5.6-7.3	0	0	0	0
	11-35	1.0-6.0	5.6-7.3	0	0	0	0

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	<i>In</i>	<i>meq/100 g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
EdsD:							
Eda-----	0-13	1.0-5.0	5.6-7.3	0	0	0	0
	13-50	1.0-6.0	5.6-7.3	0	0	0	0
	50-80	1.0-6.0	6.1-7.3	0-2	0	0	0
EdsF:							
Eda-----	0-18	1.0-5.0	5.6-7.3	0	0	0	0
	18-40	1.0-6.0	5.6-7.3	0	0	0	0
	40-80	1.0-6.0	6.1-7.3	0-2	0	0	0
FayB:							
Farry-----	0-10	5.0-11	6.1-7.8	0	0	0	0
	10-36	11-17	6.6-8.4	0-5	0	0	0
	36-50	4.0-17	7.4-8.4	0-5	0	0	0
	50-80	3.0-13	7.4-8.4	0-5	0	0	0
FraB:							
Frankirk-----	0-6	11-21	6.6-7.8	0	0	0.0-2.0	0
	6-18	21-27	6.6-8.4	0	0	0.0-2.0	0
	18-52	21-27	6.6-8.4	0-10	0	0.0-2.0	0
	52-65	12-18	7.9-8.4	5-20	0	0.0-2.0	0
	65-80	12-18	7.9-8.4	2-10	0	0.0-2.0	0
GdfB:							
Grandfield-----	0-15	6.7-11	6.1-7.8	0	0	0	0
	15-32	11-18	6.1-7.8	0	0	0	0
	32-49	9.6-18	6.6-8.4	0	0	0	0
	49-56	6.7-15	6.6-8.4	0-5	0	0	0
	56-80	3.8-15	6.6-8.4	0-5	0	0	0
GfGB:							
Grandmore-----	0-7	6.7-11	6.1-7.8	0	0	0	0
	7-24	11-18	6.6-7.8	0	0	0	0
	24-43	9.6-18	6.6-8.4	0	0	0	0
	43-70	18-30	7.9-8.4	0-10	0	0	0
	70-80	18-30	7.9-8.4	0-15	0	0	0
Grandfield-----	0-8	6.7-11	6.1-7.8	0	0	0	0
	8-17	11-18	6.1-7.8	0	0	0	0
	17-55	9.6-18	6.6-8.4	0	0	0	0
	55-72	6.7-15	6.6-8.4	0-5	0	0	0
	72-80	3.8-15	6.6-8.4	0-5	0	0	0
GlGB:							
Grandmore-----	0-11	2.6-6.7	6.1-7.8	0	0	0	0
	11-22	11-18	6.6-7.8	0	0	0	0
	22-42	9.6-18	6.6-8.4	0	0	0	0
	42-72	18-30	7.9-8.4	0-10	0	0	0
	72-80	18-30	7.9-8.4	0-15	0	0	0
Grandfield-----	0-8	3.8-6.7	6.1-7.8	0	0	0	0
	8-28	11-18	6.1-7.8	0	0	0	0
	28-55	9.6-18	6.6-8.4	0	0	0	0
	55-75	6.7-15	6.6-8.4	0-5	0	0	0
	75-80	3.8-15	6.6-8.4	0-5	0	0	0

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
GlsB:							
Grandfield-----	0-7	3.8-6.7	6.1-7.8	0	0	0	0
	7-27	11-18	6.1-7.8	0	0	0	0
	27-40	9.6-18	6.6-8.4	0	0	0	0
	40-54	6.7-15	6.6-8.4	0-5	0	0	0
	54-80	3.8-15	6.6-8.4	0-5	0	0	0
GlsD:							
Grandfield-----	0-10	3.8-6.7	6.1-7.8	0	0	0	0
	10-35	11-18	6.1-7.8	0	0	0	0
	35-55	9.6-18	6.6-8.4	0	0	0	0
	55-72	6.7-15	6.6-8.4	0-5	0	0	0
	72-80	3.8-15	6.6-8.4	0-5	0	0	0
GmuA:							
Gracemont-----	0-6	6.7-11	7.9-8.4	1-10	0-5	4.0-16.0	1-6
	6-20	6.7-11	7.9-8.4	1-10	0-5	4.0-16.0	1-6
	20-80	3.8-20	7.9-8.4	1-10	0-5	4.0-16.0	1-6
GmwA:							
Gracemont-----	0-4	6.7-11	7.9-8.4	1-10	0-5	4.0-16.0	1-6
	4-35	6.7-11	7.9-8.4	1-10	0-5	4.0-16.0	1-6
	35-80	3.8-20	7.9-8.4	1-10	0-5	4.0-16.0	1-6
GsEA:							
Gracemore-----	0-8	10-18	7.4-8.4	1-10	0-5	4.0-16.0	1-6
	8-72	2.0-6.7	7.9-8.4	1-10	0-5	4.0-16.0	1-6
Ezell-----	0-8	12-18	7.9-8.4	5-35	0-30	0.0-8.0	0-5
	8-80	4.0-9.0	7.9-8.4	0-5	0-5	0.0-4.0	0-2
HdmA:							
Hardeman-----	0-16	6.7-11	7.4-8.4	0-5	0	0.0-2.0	0
	16-55	7.8-11	7.4-8.4	1-10	0	0.0-2.0	0
	55-72	7.8-11	7.9-8.4	2-15	0	0.0-2.0	0
	72-80	3.8-11	7.9-8.4	2-15	0	0.0-2.0	0
HdmB:							
Hardeman-----	0-6	6.7-11	7.4-8.4	0-5	0	0.0-2.0	0
	6-46	7.8-11	7.4-8.4	1-10	0	0.0-2.0	0
	46-80	7.8-11	7.9-8.4	2-15	0	0.0-2.0	0
HdmC:							
Hardeman-----	0-13	6.7-11	7.4-8.4	0-5	0	0.0-2.0	0
	13-35	7.8-11	7.4-8.4	1-10	0	0.0-2.0	0
	35-62	7.8-11	7.9-8.4	2-15	0	0.0-2.0	0
	62-80	3.8-11	7.9-8.4	2-15	0	0.0-2.0	0
HdmE:							
Hardeman-----	0-12	6.7-11	7.4-8.4	0-5	0	0.0-2.0	0
	12-28	7.8-11	7.4-8.4	1-10	0	0.0-2.0	0
	28-60	7.8-11	7.9-8.4	2-15	0	0.0-2.0	0
	60-80	3.8-11	7.9-8.4	2-15	0	0.0-2.0	0
HeyB:							
Heatly-----	0-22	2.6-6.7	6.1-7.3	0	0	0.0-2.0	0
	22-43	12-18	6.1-7.3	0	0	0.0-2.0	0
	43-62	9.6-18	6.1-7.8	0	0	0.0-2.0	0
	62-72	7.8-15	6.6-8.4	0-5	0	0.0-2.0	0
	72-80	6.7-15	6.6-8.4	0-5	0	0.0-2.0	0

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
HkfA:							
Headrick-----	0-9	6.0-11	6.6-8.4	0	0	0	0
	9-45	11-18	6.6-8.4	0-3	0	0	0
	45-72	18-27	6.6-8.4	0-15	0-5	0	0
	72-80	16-27	7.9-8.4	1-20	0-5	0.0-4.0	0-6
HksA:							
Headrick-----	0-5	2.6-6.7	6.1-7.8	0	0	0	0
	5-32	11-18	6.6-8.4	0-3	0	0	0
	32-66	18-27	6.6-8.4	0-15	0-5	0	0
	66-80	16-27	7.9-8.4	1-20	0-5	0.0-4.0	0-6
HolA:							
Hollister-----	0-9	15-30	6.6-8.4	0-2	0	0	0
	9-23	20-35	7.4-8.4	2-10	0-2	0.0-2.0	0
	23-72	20-35	7.4-8.4	2-10	0-2	0.0-4.0	1-8
	72-110	15-25	7.9-8.4	3-15	0-5	0.0-6.0	1-8
	110-138	15-25	7.9-8.4	3-15	0-5	0.0-6.0	1-8
HrAC:							
Harmon-----	0-7	5.0-15	7.9-8.4	40-65	0	0	0
	7-16	5.0-15	7.9-8.4	55-85	0	0	0
	16-40	---	---	---	---	---	---
Aspermont -----	0-5	11-22	7.9-8.4	2-10	0	0	0
	5-40	7.5-24	7.9-8.4	5-20	0	0	0
	40-50	7.5-24	7.9-8.4	15-30	0	0	0
	50-80	12-24	7.4-8.4	1-8	0-2	0.0-2.0	0-8
JesC:							
Jester-----	0-7	1.5-6.7	6.6-8.4	0-2	0	0	0
	7-45	1.5-6.7	7.4-8.4	1-5	0	0	0
	45-80	1.5-6.7	7.4-8.4	1-5	0	0	0
JesF:							
Jester-----	0-8	1.5-6.7	6.6-8.4	0-2	0	0	0
	8-80	1.5-6.7	7.4-8.4	1-5	0	0	0
KcRG:							
Knoco-----	0-3	12-24	7.4-8.4	1-8	0-15	1.0-4.0	0-8
	3-9	12-24	7.4-8.4	1-8	0-15	1.0-8.0	0-8
	9-60	12-24	7.4-8.4	1-8	0-15	1.0-8.0	0-8
Rock outcrop -----	0-60	---	---	---	---	---	---
KoBE:							
Knoco-----	0-6	12-24	7.4-8.4	1-8	0-15	1.0-4.0	0-8
	6-16	12-24	7.4-8.4	1-8	0-15	1.0-8.0	0-8
	16-60	12-24	7.4-8.4	1-8	0-15	1.0-8.0	0-8
Badland -----	0-60	---	---	1-15	0-15	1.0-8.0	0-8
LacB:							
La Casa-----	0-6	16-21	7.4-8.4	0-2	0-1	0.0-2.0	0
	6-12	20-30	7.4-8.4	0-5	0-2	0.0-2.0	0
	12-34	20-30	7.9-8.4	10-15	0-2	0.0-2.0	0
	34-64	18-30	7.9-8.4	10-40	0-2	0.0-2.0	0-2
	64-81	18-30	7.9-8.4	5-25	0-4	0.0-4.0	0-2
	81-91	18-30	7.4-8.4	2-10	0-8	2.0-8.0	0-6

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
LDF:							
Landfill-----	0-80	---	---	---	---	0	---
LnuA:							
Lincoln-----	0-8	1.5-10	7.4-8.4	0-5	0	0	0
	8-21	1.5-10	7.9-8.4	0-5	0	0	0
	21-80	1.5-10	7.9-8.4	0-5	0	0	0
LnWA:							
Lincoln-----	0-5	1.5-10	7.4-8.4	0-5	0	0	0
	5-15	1.5-10	7.9-8.4	0-5	0	0	0
	15-80	1.5-10	7.9-8.4	0-5	0	0	0
Westola-----	0-5	7.0-11	7.4-8.4	1-5	0	0	0
	5-30	4.0-11	7.9-8.4	1-10	0	0	0
	30-80	4.0-11	7.9-8.4	1-10	0	0	0
M-W:							
Water.							
MagA:							
Madge-----	0-8	10-15	6.1-7.8	0	0	0	0
	8-18	10-15	6.1-7.8	0	0	0	0
	18-26	11-21	6.6-8.4	0-2	0	0	0
	26-47	11-21	6.6-8.4	0-10	0	0	0
	47-64	7.0-15	6.6-8.4	0-15	0	0	0
	64-80	7.0-15	7.4-8.4	0-15	0	0	0
MagB:							
Madge-----	0-11	10-15	6.1-7.8	0	0	0	0
	11-15	11-21	6.6-8.4	0-2	0	0	0
	15-22	11-21	6.6-8.4	0-2	0	0	0
	22-42	11-21	6.6-8.4	0-10	0	0	0
	42-70	11-21	6.6-8.4	0-10	0	0	0
	70-80	7.0-15	6.6-8.4	0-15	0	0	0
MngA:							
Mangum-----	0-7	17-24	7.9-8.4	0-5	0	0.0-2.0	0
	7-21	21-36	7.9-8.4	5-15	0-2	0.0-4.0	0
	21-80	18-33	7.9-8.4	5-15	0-5	0.0-8.0	0
NipA:							
Nipsum-----	0-10	21-24	7.4-8.4	0-1	0	0.0-2.0	0
	10-30	21-27	7.4-8.4	0-10	0-1	0.0-2.0	0
	30-45	21-33	7.9-8.4	5-20	0-5	0.0-2.0	0
	45-80	17-33	7.9-8.4	5-20	1-5	0.0-2.0	0
NOTCOM:							
Area not surveyed, access denied.							
OakA:							
Oakley-----	0-12	10-15	7.4-8.4	2-10	0	0.0-2.0	0
	12-43	12-20	7.9-8.4	10-35	0-2	0.0-2.0	0-6
	43-58	12-20	7.9-9.0	10-35	0-2	0.0-4.0	0-8
	58-85	5.0-18	7.9-9.0	3-20	0-2	0.0-8.0	0-8
	85-95	5.0-18	7.9-9.0	3-15	0-2	0.0-8.0	0-8
	95-100	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
OakB:							
Oakley-----	0-7	10-15	7.4-8.4	2-10	0	0.0-2.0	0
	7-41	12-20	7.9-8.4	10-35	0-2	0.0-2.0	0-6
	41-49	12-20	7.9-9.0	10-35	0-2	0.0-4.0	0-8
	49-72	5.0-18	7.9-9.0	3-20	0-2	0.0-8.0	0-8
	72-95	5.0-18	7.9-9.0	3-15	0-2	0.0-8.0	0-8
	95-100	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8
OzkA:							
Ozark-----	0-11	5.0-12	6.1-7.8	0	0	0	0
	11-24	11-21	6.6-7.8	0-5	0-2	0.0-2.0	0-6
	24-59	11-21	7.4-8.4	2-15	0-5	0.0-4.0	0-12
	59-83	5.5-21	7.9-8.4	2-10	0-5	0.0-4.0	0-12
	83-105	18-30	7.9-8.4	2-10	0-5	0.0-4.0	0-12
	105-110	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8
OzsA:							
Ozark-----	0-14	5.0-12	6.1-8.4	0-2	0-5	4.0-25.0	1-6
	14-25	11-21	6.6-9.0	0-5	0-5	1.0-8.0	1-12
	25-50	11-21	7.9-9.0	2-15	0-5	1.0-8.0	1-12
	50-73	5.5-21	7.9-9.0	2-10	0-5	0.0-4.0	1-12
	73-100	5.5-21	7.9-9.0	2-10	0-5	0.0-4.0	1-12
	100-110	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8
PIT:							
Pits-----	0-80	---	7.4-8.4	---	---	---	---
RakA:							
Roark-----	0-10	9.5-16	6.1-7.8	0	0-2	0.0-2.0	0
	10-24	21-27	7.4-8.4	0-5	0-2	0.0-2.0	0-2
	24-34	21-27	7.9-8.4	1-10	0-2	0.0-4.0	0-6
	34-49	21-27	7.9-8.4	1-10	0-2	0.0-4.0	0-6
	49-67	10-21	7.9-8.4	1-10	0-2	0.0-8.0	0-6
	67-80	4.0-21	7.9-8.4	1-5	0-4	0.0-8.0	0-6
RKBG:							
Rock outcrop-----	0-60	---	---	---	---	---	---
Brico-----	0-11	9.0-16	6.1-7.3	0	0	0	0
	11-24	21-35	6.1-7.3	0	0	0	0
	24-40	21-35	6.1-7.3	0	0	0	0
	40-72	16-21	6.1-7.3	0	0	0	0
RKO:							
Rock outcrop-----	0-60	---	---	---	---	---	---
RuuA:							
Rups-----	0-7	16-21	7.4-8.4	0-5	0-2	4.0-20.0	0-4
	7-21	16-21	7.9-8.4	3-15	1-5	8.0-30.0	0-13
	21-43	16-21	7.9-8.4	3-15	1-5	8.0-30.0	0-13
	43-80	16-27	7.9-8.4	3-15	1-5	8.0-30.0	0-13
RuwA:							
Rups-----	0-15	16-21	7.4-8.4	0-5	0-2	4.0-20.0	0-4
	15-48	16-21	7.9-8.4	3-15	1-5	8.0-30.0	0-13
	48-80	16-27	7.9-8.4	3-15	1-5	8.0-30.0	0-13

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
SkCC2:							
Spikebox-----	0-6	5.5-12	7.4-8.4	0-15	0	0	0
	6-13	5.5-12	7.8-8.4	0-15	0-2	0.0-2.0	0
	13-40	---	---	---	---	---	---
Cobb-----	0-7	4.5-15	6.1-7.3	0	0	0.0-2.0	0
	7-28	11-21	6.1-8.4	0-5	0	0.0-2.0	0
	28-39	6.5-21	6.1-8.4	0-5	0	0.0-2.0	0
	39-80	---	---	---	---	---	---
SpDB:							
Springer-----	0-13	2.0-7.0	5.6-7.8	0	0	0.0-1.0	0
	13-42	6.0-12	6.1-8.4	0	0	0.0-1.0	0
	42-57	2.0-8.0	6.6-8.4	0	0	0.0-1.0	0
	57-80	6.0-16	6.6-8.4	0-5	0	0.0-2.0	0
Devol-----	0-14	2.0-5.5	5.6-7.8	0	0	0	0
	14-29	5.5-11	6.1-8.4	0	0	0	0
	29-45	2.0-11	6.1-8.4	0	0	0	0
	45-65	2.0-6.7	6.6-8.4	0-5	0	0	0
	65-80	2.0-6.7	6.6-8.4	0-5	0	0	0
SurA:							
Spur-----	0-14	17-21	7.9-8.4	0-2	0	0.0-2.0	0
	14-30	12-21	7.9-8.4	2-10	0	0.0-2.0	0
	30-51	12-21	7.9-8.4	2-10	0	0.0-2.0	0
	51-80	9.6-21	7.9-8.4	2-10	0	0.0-2.0	0
SuuA:							
Spur-----	0-10	17-21	7.9-8.4	0-2	0	0.0-2.0	0
	10-16	12-21	7.9-8.4	0-2	0	0.0-2.0	0
	16-48	12-21	7.9-8.4	2-10	0	0.0-2.0	0
	48-80	9.6-21	7.9-8.4	2-10	0-2	0.0-4.0	0
SuwA:							
Spur-----	0-8	17-21	7.9-8.4	0-2	0	0.0-2.0	0
	8-17	12-21	7.9-8.4	2-10	0	0.0-2.0	0
	17-35	12-21	7.9-8.4	2-10	0	0.0-2.0	0
	35-49	12-21	7.9-8.4	2-10	0	0.0-2.0	0
	49-80	9.6-21	7.9-8.4	2-10	0	0.0-2.0	0
TARD:							
Talpa-----	0-7	12-17	7.9-8.4	10-40	0	0	0
	7-40	---	---	---	---	---	---
Aspermont-----	0-10	11-22	7.9-8.4	2-10	0	0	0
	10-42	7.5-24	7.9-8.4	15-30	0	0	0
	42-80	12-24	7.4-8.4	1-8	0-2	0.0-2.0	0-8
Rock outcrop-----	0-60	---	---	---	---	---	---
Tila:							
Tillman-----	0-8	16-22	6.6-8.4	0	0	0.0-2.0	0-1
	8-15	20-30	7.4-8.4	0-2	0	0.0-2.0	0-1
	15-45	20-30	7.9-8.4	2-15	0-2	0.0-4.0	0-12
	45-62	20-30	7.9-8.4	5-30	0-2	0.0-8.0	0-12
	62-78	15-35	7.4-8.4	2-30	0-2	0.0-8.0	0-12
	78-90	15-35	7.9-8.4	1-10	0-2	0.0-8.0	0-12
	90-100	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	<i>In</i>	<i>meq/100 g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
TilB:							
Tillman-----	0-6	16-22	6.6-8.4	0	0	0.0-2.0	0-1
	6-10	20-30	7.4-8.4	0-2	0	0.0-2.0	0-1
	10-25	20-30	7.4-8.4	0-5	0-2	0.0-2.0	0-2
	25-48	20-30	7.9-8.4	2-15	0-2	0.0-4.0	0-12
	48-60	20-30	7.9-8.4	5-30	0-2	0.0-8.0	0-12
	60-82	15-35	7.4-8.4	2-30	0-2	0.0-8.0	0-12
	82-90	15-35	7.9-8.4	1-10	0-2	0.0-8.0	0-12
	90-100	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8
TipA:							
Tipton-----	0-8	9.5-16	6.6-7.8	0	0	0	0
	8-15	9.5-16	6.6-7.8	0	0	0	0
	15-25	12-21	6.6-8.4	0	0	0	0
	25-41	12-21	7.4-8.4	1-10	0	0	0
	41-66	9.5-21	7.9-8.4	3-15	0	0.0-2.0	0
	66-80	6.5-21	7.9-8.4	1-15	0	0.0-4.0	0
TlvB:							
Tilvern-----	0-5	21-25	7.4-8.4	0-5	0	0.0-2.0	0-2
	5-11	21-33	7.9-8.4	2-10	0	0.0-2.0	0-2
	11-31	18-33	7.9-8.4	2-15	0-3	0.0-4.0	0-10
	31-44	18-33	7.9-8.4	2-20	1-5	2.0-12.0	2-12
	44-51	18-33	7.9-8.4	2-20	1-5	2.0-12.0	2-12
	51-80	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8
TpfA:							
Tipton-----	0-7	6.5-12	6.6-7.8	0	0	0	0
	7-13	6.5-12	6.6-7.8	0	0	0	0
	13-24	9.5-16	6.6-7.8	0	0	0	0
	24-47	12-21	6.6-8.4	0	0	0	0
	47-63	12-21	7.4-8.4	1-10	0	0	0
	63-80	6.5-21	7.9-8.4	1-15	0	0.0-4.0	0
TrwB:							
Treadway-----	0-7	15-24	7.9-9.0	0-10	0-10	0.0-8.0	0-8
	7-20	20-32	7.9-9.0	2-15	2-15	0.0-8.0	0-8
	20-64	20-32	7.9-9.0	2-15	2-15	0.0-8.0	0-8
	64-80	20-32	7.9-9.0	2-15	2-20	2.0-16.0	0-8
UST:							
Ustorthents-----	0-60	---	---	---	---	---	---
VeKE:							
Vernon-----	0-6	18-24	7.9-8.4	0-15	0	0.0-2.0	0-2
	6-26	21-35	7.9-8.4	5-20	0-2	0.0-8.0	2-12
	26-80	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8
Knoco-----	0-6	12-24	7.4-8.4	1-8	0-15	1.0-4.0	0-8
	6-16	12-24	7.4-8.4	1-8	0-15	1.0-8.0	0-8
	16-60	12-24	7.4-8.4	1-8	0-15	1.0-8.0	0-8
VerC:							
Vernon-----	0-6	18-24	7.9-8.4	0-15	0	0.0-2.0	0-2
	6-26	21-35	7.9-8.4	5-20	0-2	0.0-8.0	2-12
	26-35	21-35	7.9-8.4	5-20	0-2	0.0-8.0	2-12
	35-80	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8

Soil Survey of Jackson County, Oklahoma

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
VeTE:							
Vernon-----	0-7	18-24	7.9-8.4	0-15	0	0.0-2.0	0-2
	7-16	21-35	7.9-8.4	5-20	0-2	0.0-8.0	2-12
	16-25	21-35	7.9-8.4	5-20	0-2	0.0-8.0	2-12
	25-38	21-35	7.9-8.4	1-15	0-2	0.0-8.0	2-12
	38-80	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8
Talpa -----	0-9	12-17	7.9-8.4	10-40	0	0	0
	9-40	---	---	---	---	---	---
W:							
Water.							
WodB:							
Woods-----	0-8	11-24	7.9-8.4	0-5	0	0.0-2.0	0
	8-15	21-36	7.9-8.4	5-15	0	0.0-2.0	0
	15-33	21-36	7.9-8.4	5-15	0	0.0-2.0	0
	33-49	17-36	7.9-8.4	15-40	0	0.0-2.0	0
	49-64	17-36	7.9-8.4	15-40	0	0.0-2.0	0
	64-80	11-36	7.9-8.4	5-20	0	0.0-2.0	0
WslA:							
Westola-----	0-12	7.0-11	7.4-8.4	1-5	0	0	0
	12-50	4.0-11	7.9-8.4	1-10	0	0	0
	50-80	4.0-11	7.9-8.4	1-10	0	0	0
WstA:							
Westola-----	0-8	7.0-11	7.4-8.4	1-5	0	0	0
	8-19	7.0-11	7.4-8.4	1-5	0	0	0
	19-30	4.0-11	7.9-8.4	1-10	0	0	0
	30-80	4.0-11	7.9-8.4	1-10	0	0	0
WtlA:							
Westill-----	0-5	16-22	6.6-8.4	0	0	0.0-2.0	0-1
	5-15	20-30	7.4-8.4	0-5	0	0.0-2.0	0-2
	15-24	20-30	7.4-8.4	0-10	0	0.0-2.0	0-2
	24-55	18-35	7.9-8.4	2-15	0-2	0.0-4.0	0-6
	55-70	15-35	7.9-8.4	1-10	0-3	1.0-8.0	0-6
	70-80	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8
WtlB:							
Westill-----	0-9	16-22	6.6-8.4	0	0	0.0-2.0	0-1
	9-16	20-30	7.4-8.4	0-5	0	0.0-2.0	0-2
	16-47	18-35	7.9-8.4	2-15	0-2	0.0-4.0	0-6
	47-56	15-35	7.9-8.4	2-15	0-3	1.0-8.0	0-6
	56-68	15-35	7.9-8.4	1-10	0-3	1.0-8.0	0-6
	68-80	12-24	7.4-8.4	1-8	0-2	1.0-8.0	0-8

Chemical Analyses of Selected Soils

(The symbol < means less than. TR means trace. Dashes indicate that analyses were not made.)

Soil name and sample number ¹	Depth	Horizon	Total carbon	Organ- ic carbon	Extractable bases (ammonium acetate)				Extract- able acidity	Cation-exchange capacity		Base saturation		Calcium carbon- ate <2 mm	Exch. Na	Salin- ity	pH	
					Ca	Mg	Na	K		Sum of cations	Ammonium acetate	Sum of cations	Ammonium acetate				CaCl ₂ 1:2	H ₂ O 1:1
	In		Pct	Pct	-----Milliequivalents per 100 grams of soil-----					Pct	Pct	Pct	Pct	mmhos /cm				
Arnett S97OK-065- 001	0-7	Ap	0.69	----	11.2	1.9	TR	0.8	2.7	16.6	10.3	84	100	--	--	----	6.3	6.8
	7-11	Bt1	0.72	----	20.8	3.1	---	0.7	3.6	28.2	19.7	87	100	--	--	----	6.7	7.3
	11-17	Bt2	0.53	----	17.1	3.2	0.3	0.9	3.6	25.1	18.6	86	100	--	--	----	6.9	7.6
	17-31	2Bt3	0.25	----	15.0	2.5	0.2	0.1	2.0	19.8	14.0	90	100	TR	--	----	7.1	7.7
	31-44	2BC	0.27	----	----	2.0	---	0.5	0.4	----	9.7	---	100	2	--	----	7.6	8.1
	44-57	2C1	2.23	----	----	2.0	0.2	0.5	---	----	6.5	100	100	16	--	----	7.7	8.2
	57-84	3C2	1.06	----	----	3.9	0.4	0.5	---	----	9.6	100	100	8	--	----	7.8	8.2
	84-99	3C3	----	----	----	---	---	---	---	----	---	---	---	6	--	----	---	---
Aspermont S97OK-065- 004	0-6	Ap	1.97	----	----	3.7	---	0.8	---	----	17.4	100	100	9	TR	0.50	7.6	8.0
	6-23	Bk1	2.62	----	----	4.7	---	---	---	----	16.2	100	100	21	TR	----	7.7	8.1
	23-34	Bk2	1.12	----	----	8.2	---	---	---	----	16.8	100	100	8	TR	----	7.7	8.2
	34-43	Bk3	1.26	----	----	12.1	---	0.9	---	----	22.5	100	100	10	TR	----	7.7	8.2
	43-50	BC	4.59	----	----	9.0	---	0.4	---	----	14.7	100	100	38	TR	----	7.8	8.2
	50-68	C1	8.01	----	----	9.0	---	---	---	----	7.6	100	100	67	TR	----	7.8	8.4
	68-91	C2	1.17	----	----	8.1	1.3	0.9	---	----	14.6	100	100	10	8	0.47	7.7	8.2
Decobb ² S96OK-065- 004	0-5	Ap	0.61	0.67	6.0	2.4	0.4	---	5.1	13.9	8.6	63	100	--	--	----	5.2	5.7
	5-18	A	0.53	0.53	26.4	3.0	---	0.7	2.6	32.7	11.5	92	100	--	--	----	6.6	7.1
	18-22	BA	0.46	0.46	7.7	2.9	TR	0.7	2.8	14.1	12.7	80	89	--	--	----	7.1	7.6
	22-36	Bt1	0.32	0.39	12.8	3.4	0.9	0.9	2.2	20.2	14.9	89	100	--	--	----	7.5	8.1
	36-50	Bt2	----	0.24	10.9	2.2	TR	0.5	1.1	14.6	12.0	92	100	--	--	----	7.6	8.2
	50-59	BC	----	0.18	11.6	2.1	0.1	0.7	0.6	15.1	11.2	96	100	--	--	----	7.6	8.3
	59-62	BCK	----	0.15	----	2.8	0.4	0.8	---	----	6.6	100	100	13	--	----	8.0	8.6
	62-79	2Cr	----	0.01	----	1.3	0.2	0.7	---	----	3.3	100	100	2	--	----	7.9	8.7
Eastall S98OK-065- 003	0-5	Ap	1.46	----	----	9.0	0.2	2.7	0.4	----	35.5	---	100	1	1	0.65	7.5	8.0
	5-12	A	1.26	----	----	8.5	0.2	2.3	0.7	----	34.7	---	100	1	1	----	7.5	7.9
	12-19	Bw	0.72	----	27.3	6.2	0.2	1.8	1.5	37.0	33.2	96	100	TR	1	----	7.4	7.7
	19-39	Bss1	0.70	----	27.7	7.0	0.1	1.9	1.1	37.8	31.3	97	100	TR	TR	----	7.4	7.8
	39-56	Bss2	0.65	----	----	8.1	0.3	1.6	0.5	----	30.4	---	100	2	1	----	7.5	8.0
	56-76	Bss3	0.68	----	----	9.4	0.2	1.5	---	----	28.6	100	100	2	1	----	7.6	7.9
	76-95	Bssk	0.69	----	----	10.0	0.2	1.3	---	----	25.9	100	100	4	1	----	7.6	8.0

See footnotes at end of table.

Chemical Analyses of Selected Soils--Continued

Soil name and sample number ¹	Depth	Horizon	Total carbon	Organ- ic carbon	Extractable bases (ammonium acetate)				Extract- able acidity	Cation-exchange capacity		Base saturation		Calcium carbon- ate <2 mm	Exch. Na	Salin- ity	pH	
					Ca	Mg	Na	K		Sum of cations	Ammonium acetate	Sum of cations	Ammonium acetate				CaCl ₂ 1:2	H ₂ O 1:1
	In		Pct	Pct	-----Milliequivalents per 100 grams of soil-----						Pct	Pct	Pct	Pct	mmhos /cm			
Hardeman S97OK-065- 006	0-6	Ap	0.38	----	5.4	1.0	0.4	0.9	2.7	10.4	4.7	74	100	--	--	----	5.1	5.3
	6-17	Bw1	0.33	----	10.6	2.3	0.3	0.9	2.4	16.5	9.7	85	100	--	--	----	6.2	6.8
	17-31	Bw2	0.26	----	12.2	2.5	0.4	0.2	2.1	17.4	11.1	88	100	--	--	----	6.8	7.5
	31-46	Bw3	0.24	----	10.0	2.4	0.5	0.5	1.8	15.2	11.9	88	100	--	--	----	7.0	7.6
	46-66	Bk	0.39	----	----	2.7	0.5	0.4	---	----	8.6	100	100	2	--	----	7.7	8.1
	66-86	Bk	0.23	----	----	3.7	0.4	0.4	---	----	7.8	100	100	1	--	----	7.7	8.1
	86-119	Bk	0.01	----	9.1	3.0	0.4	0.3	0.5	13.3	6.4	96	100	TR	--	----	7.7	8.2
	119- 131	2BCK	1.36	----	----	7.0	0.4	0.4	---	----	13.7	100	100	11	--	----	7.8	8.3
Harmon S97OK-065- 009	0-7	Ap	6.79	----	----	5.4	1.5	2.3	---	----	8.5	100	100	51	--	----	7.6	8.0
	7-16	ACk	10.07	----	----	7.4	0.4	0.5	---	----	6.0	100	100	82	--	----	7.7	8.1
Headrick ³ S96OK-065- 001	0-14	Ap	0.10	0.11	2.0	1.4	0.3	1.0	0.7	5.4	3.0	87	100	TR	--	----	7.1	8.0
	14-21	Bt1	0.27	0.24	5.9	4.8	0.5	1.1	2.1	14.4	11.5	85	100	TR	--	----	7.3	8.4
	21-29	Bt2	----	0.10	6.2	4.9	1.0	1.4	1.5	15.0	9.0	90	100	TR	--	----	7.4	8.4
	29-51	Bt3	----	0.07	9.2	3.9	0.5	1.1	1.0	15.7	9.4	94	100	TR	--	----	7.8	8.4
	51-66	Bt4	----	0.05	----	4.6	0.6	0.7	0.3	----	11.9	---	100	1	--	----	8.0	8.4
	66-71	2BCK	----	0.06	----	5.8	0.6	1.4	1.4	----	14.7	100	100	28	--	----	8.0	8.4
Hollister ⁴ S96OK-065- 006	0-7	Ap	1.08	0.98	----	3.4	0.1	1.6	0.3	----	26.9	---	100	1	TR	----	7.7	8.0
	7-14	Bw	1.18	0.55	----	6.9	1.1	1.2	---	----	27.5	100	100	5	4	----	7.7	8.4
	14-31	Bss1	1.70	0.38	----	11.3	1.7	1.4	---	----	26.2	100	100	9	7	----	8.0	8.5
	31-39	Bss2	----	0.31	----	11.2	2.9	1.1	---	----	24.7	100	100	10	12	----	8.2	8.8
	39-56	Bss3	----	0.18	----	10.6	3.8	0.2	---	----	25.0	100	100	10	12	1.22	8.3	8.5
	56-72	Bss4	----	0.10	----	9.2	4.0	1.7	---	----	21.8	100	100	12	10	5.01	7.9	8.0
	72-80	Bk	----	0.08	----	7.6	4.2	0.9	---	----	17.1	100	100	25	16	4.79	7.9	7.9
	80-110	BCK	----	0.06	----	7.6	4.2	1.0	---	----	16.6	100	100	18	14	4.64	8.0	8.0
	110- 138	2C	----	0.03	----	7.3	4.5	0.6	---	----	18.9	100	100	16	13	4.99	7.8	8.1
	Hollister satel- lite	0-9	Ap	1.13	1.14	25.7	2.8	---	---	1.5	30.0	25.8	95	100	TR	TR	----	7.7
	9-23	Bw	0.82	0.68	----	6.7	0.3	1.2	---	----	29.2	100	100	1	1	----	7.8	8.2
	23-33	Bss1	1.22	0.46	----	10.3	1.6	0.2	---	----	27.4	100	100	6	6	----	8.0	8.4

See footnotes at end of table.

Chemical Analyses of Selected Soils--Continued

Soil name and sample number ¹	Depth	Horizon	Total carbon	Organ- ic carbon	Extractable bases (ammonium acetate)				Extract- able acidity	Cation-exchange capacity		Base saturation		Calcium carbon- ate <2 mm	Exch. Na	Salin- ity	pH	
					Ca	Mg	Na	K		Sum of cations	Ammonium acetate	Sum of cations	Ammonium acetate				CaCl ₂ 1:2	H ₂ O 1:1
	In		Pct	Pct	-----Milliequivalents per 100 grams of soil-----						Pct	Pct	Pct	Pct	mmhos /cm			
La Casa S97OK-065- 002	0-6	Ap	1.24	----	----	4.2	0.2	1.4	1.1	----	22.4	---	100	1	1	0.76	7.6	7.9
	6-12	Bt1	1.41	----	----	3.3	0.2	1.1	---	----	23.9	100	100	6	1	----	7.6	8.0
	12-24	Bt2	0.97	----	----	5.2	0.3	0.9	---	----	24.1	100	100	6	1	----	7.6	8.1
	24-34	Bt2	0.65	----	----	6.6	0.3	0.9	---	----	23.5	100	100	3	1	----	7.6	8.1
	34-47	Btk1	3.62	----	----	6.0	0.6	0.7	---	----	15.4	100	100	28	4	----	7.6	8.1
	47-64	Btk2	2.40	----	----	8.0	1.0	0.8	---	----	17.5	100	100	19	6	----	7.6	8.1
	64-81	BCK	2.17	----	----	7.4	0.9	0.8	---	----	17.9	100	100	17	5	0.50	7.6	8.1
	81-90	C	3.55	----	----	8.6	1.0	0.8	---	----	17.3	100	100	28	5	2.46	7.5	7.6
Oakley S97OK-065- 005	0-7	Ap	1.17	----	----	3.3	0.6	0.9	---	----	12.4	100	100	6	4	0.44	7.5	7.9
	7-12	A	0.91	----	----	3.2	0.9	1.1	---	----	11.7	100	100	7	7	0.57	7.6	7.9
	12-21	Bk1	3.04	----	----	3.3	0.5	0.2	---	----	11.0	100	100	21	4	0.39	7.7	8.1
	21-30	Bk1	3.31	----	----	4.3	0.5	0.8	---	----	10.5	100	100	24	4	0.32	7.7	8.2
	30-43	Bk2	3.71	----	----	5.6	0.8	0.1	---	----	9.4	100	100	29	8	0.44	7.8	8.5
	43-58	Bk3	2.36	----	----	6.5	1.7	0.3	---	----	8.9	100	100	19	17	0.65	8.0	8.7
	58-85	BC	1.11	----	----	7.5	1.6	0.6	---	----	8.8	100	100	9	16	0.92	8.0	8.8
Ozark ⁵ S96OK-065- 002	0-11	Ap	0.36	0.36	5.6	2.0	0.4	0.8	2.6	11.4	8.6	77	100	--	5	----	6.4	7.1
	11-24	Bt	0.18	0.20	7.7	3.7	1.2	0.7	3.3	16.6	13.5	80	99	TR	9	----	6.7	7.6
	24-39	Btk1	----	0.10	----	6.3	3.1	0.8	1.8	----	16.6	---	100	1	19	----	8.1	8.5
	39-50	Btk2	----	0.06	----	4.4	2.9	1.1	---	----	11.6	100	100	2	20	1.54	7.9	8.6
	50-61	Btk3	----	0.05	----	4.9	3.6	0.9	0.5	----	11.9	---	100	2	23	1.87	8.5	8.9
	61-83	BC	----	1.97	4.9	3.4	2.6	0.8	1.0	12.7	7.4	92	100	TR	35	----	8.0	8.8
Tillman ⁶ S96OK-065- 003	0-6	Ap	0.78	0.83	10.3	3.9	0.3	0.3	3.3	18.1	15.7	82	94	--	2	----	6.7	7.0
	6-17	Bt1	0.77	0.74	16.4	8.5	0.7	1.4	4.3	31.3	27.5	86	98	TR	2	----	7.0	7.5
	17-30	Bt2	0.77	0.42	----	14.1	1.5	1.3	---	----	27.6	100	100	3	5	----	8.0	8.6
	30-42	Btk1	0.82	0.26	----	15.1	5.4	2.3	---	----	26.5	100	100	5	17	1.58	8.3	8.5
	42-50	Btk2		0.20	----	15.0	6.8	---	---	----	27.2	100	100	3	17	4.69	8.1	8.2
	50-61	Btky		0.10	----	15.2	7.5	1.3	---	----	26.8	100	100	3	15	8.67	7.8	7.9
	61-74	Bk		0.08	----	10.1	5.4	0.7	---	----	16.3	100	100	38	19	6.85	8.1	8.2
	74-84	BCK		0.07	----	9.5	5.1	---	---	----	14.4	100	100	28	19	6.35	8.1	8.2
	84-92	2Cr		0.06	----	9.2	6.2	0.8	---	----	16.7	100	100	22	22	6.79	8.1	8.2

See footnotes at end of table.

Chemical Analyses of Selected Soils--Continued

Soil name and sample number ¹	Depth	Horizon	Total carbon	Organ- ic carbon	Extractable bases (ammonium acetate)				Extract- able acidity	Cation-exchange capacity		Base saturation		Calcium carbon- ate <2 mm	Exch. Na	Salin- ity	pH	
					Ca	Mg	Na	K		Sum of cations	Ammonium acetate	Sum of cations	Ammonium acetate				CaCl ₂ 1:2	H ₂ O 1:1
	In		Pct	Pct	-----Milliequivalents per 100 grams of soil-----							Pct	Pct	Pct	Pct	mmhos /cm		
Tilvern S98OK-065- 004	0-5	Ap	1.03	----	----	4.9	0.4	1.1	0.1	----	22.5	---	100	2	2	0.86	7.6	8.1
	5-11	Bk1	0.61	----	----	9.3	1.0	0.7	---	----	24.3	100	100	2	4	0.71	7.7	8.2
	11-23	Bk2	0.55	----	----	12.6	2.6	0.7	0.3	----	25.9	---	100	2	9	0.82	7.8	8.5
	23-31	Bssk	0.68	----	----	12.2	3.8	0.7	---	----	24.2	100	100	4	12	1.69	7.9	8.3
	31-44	Bky	0.14	----	77.8	12.5	5.6	0.8	---	96.7	24.0	100	100	TR	12	7.12	7.5	7.5
	44-51	BCKy	0.17	----	----	0.1	0.2	0.5	---	----	23.8	100	100	1	1	8.51	7.6	7.6
Westill ⁷ S97OK-057- 004	0-5	Ap	1.09	----	----	3.2	0.2	1.7	1.4	----	19.2	---	100	1	1	1.32	7.5	7.8
	5-15	Bt1	0.82	----	----	5.9	---	1.0	0.5	----	24.7	---	100	1	TR	0.51	7.5	8.0
	15-24	Bt2	1.21	----	----	9.5	0.4	1.0	---	----	23.0	100	100	7	2	0.46	7.7	8.1
	24-40	Btk1	1.53	----	----	10.6	1.1	1.0	---	----	21.7	100	100	10	4	0.52	7.7	8.2
	40-55	Btk2	1.48	----	----	10.0	1.5	0.7	---	----	18.5	100	100	13	6	0.67	7.7	8.1
	55-79	C	0.95	----	----	9.8	2.1	0.8	---	----	19.0	100	100	7	8	1.26	7.6	8.0

¹ Locations of sampled pedons are as follows:

Arnett sandy loam (S97OK-065-001), about 850 feet south and 250 feet west of the northeast corner of sec. 22, T. 1 S., R. 24 W.
 Aspermont silt loam (S97OK-065-004), about 950 feet north and 1,500 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.
 Decobb very fine sandy loam (S96OK-065-004), about 1,800 feet north and 90 east of the southwest corner of sec. 6, T. 1 S., R. 20 W.
 Eastall silty clay (S98OK-065-003), about 2,500 feet north and 2,100 feet west of the southeast corner of sec. 34, T. 1 N., R. 23 W.
 Hardeman fine sandy loam (S97OK-065-006), about 2,650 feet north and 1,500 feet west of the southeast corner of sec. 31, T. 3 N., R. 18 W.
 Harmon very gravelly silt loam (S97OK-065-009), about 550 feet north and 1,350 east of the southwest corner of sec. 22, T. 2 N., R. 23 W.
 Headrick loamy sand (S96OK-065-001), about 775 feet south and 650 west of the northeast corner of sec. 7, T. 3 N., R. 19 W.
 Hollister silty clay loam (S96OK-065-006), about 540 feet north and 2,470 feet east of the southwest corner of sec. 30, T. 1 N., R. 21 W.
 La Casa silty clay loam (S97OK-065-002), about 400 feet north and 500 feet east of the southwest corner of sec. 22, T. 2 N., R. 23 W.
 Oakley loam (S97OK-065-005), about 450 feet north and 1,100 feet west of the southeast corner of sec. 28, T. 3 N., R. 19 W.
 Ozark fine sandy loam (S96OK-065-002), about 500 feet north and 2,000 feet west of the southeast corner of sec. 29, T. 3 N., R. 19 W.
 Tillman silt loam (S96OK-065-003), about 500 feet north and 1,600 feet west of the southeast corner of sec. 14, T. 2 N., R. 19 W.
 Tilvern silty clay loam (S98OK-065-004), about 1,200 feet north and 2,200 feet east of the southwest corner sec. 24, T. 1 N., R. 23 W.
 Westill clay loam (S97OK-057-004), about 2,150 feet north and 150 feet west of the southeast corner of sec. 4, T. 2 N., R. 25 W.

² The content of organic carbon, by weighted average, in the upper 10 inches of this pedon meets the minimum requirement for a mollic epipedon.

³ This pedon is slightly deeper to a lithologic discontinuity than is described as the range for the series.

⁴ This pedon of the Hollister series was sampled in a microhigh at the location described in footnote 1, and the satellite sample was taken from the same pit in a microlow about 8 feet to the southeast of the given location. Both pedons appeared identical below a depth of 33 inches.

⁵ The content of organic carbon in the upper 10 inches of this pedon does not meet the minimum requirement for a mollic epipedon.

⁶ The surface layer of this pedon is silt loam, and that of the Tillman map unit is clay loam.

⁷ This pedon was sampled in Harmon County, Oklahoma, and was originally correlated to the Tillman series and map unit 55 in the soil survey of Harmon County published in 1984 (USDA, 1984).

Soil Survey of Jackson County, Oklahoma

Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
AcmA:									
Acme-----	B	January	4.0-6.0	>6.0	---	---	None	---	None
		February	4.0-6.0	>6.0	---	---	None	---	None
		March	4.0-6.0	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		May	4.0-6.0	>6.0	---	---	None	---	None
		November	4.0-6.0	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
ArHF:									
Arnett-----	B	Jan-Dec	---	---	---	---	None	---	None
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
ArnB:									
Arnett-----	B	Jan-Dec	---	---	---	---	None	---	None
ArnC:									
Arnett-----	B	Jan-Dec	---	---	---	---	None	---	None
AsmB:									
Aspermont-----	B	Jan-Dec	---	---	---	---	None	---	None
AsmC:									
Aspermont-----	B	Jan-Dec	---	---	---	---	None	---	None
BekA:									
Beckman-----	D	January	3.0-5.9	>6.0	---	---	None	---	None
		February	3.0-5.9	>6.0	---	---	None	---	None
		March	3.0-5.9	>6.0	---	---	None	---	None
		April	3.0-5.9	>6.0	---	---	None	Very brief	Occasional
		May	3.0-5.9	>6.0	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	3.0-5.9	>6.0	---	---	None	Very brief	Occasional
		November	3.0-5.9	>6.0	---	---	None	---	None
		December	3.0-5.9	>6.0	---	---	None	---	None
BfdB:									
Burford-----	C	Jan-Dec	---	---	---	---	None	---	None
BfdC:									
Burford-----	C	Jan-Dec	---	---	---	---	None	---	None
CobB:									
Cobb-----	B	Jan-Dec	---	---	---	---	None	---	None
CVRD:									
Cottonwood-----	C	Jan-Dec	---	---	---	---	None	---	None
Vinson-----	B	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-----	D	Jan-Dec	---	---	---	---	None	---	None

Soil Survey of Jackson County, Oklahoma

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
DAM:									
Dam-----	D	Jan-Dec	---	---	---	---	None	---	None
DcbB:									
Decobb-----	B	Jan-Dec	---	---	---	---	None	---	None
DeSD:									
Devol-----	B	Jan-Dec	---	---	---	---	None	---	None
Springer-----	B	Jan-Dec	---	---	---	---	None	---	None
EatA:									
Eastall-----	D								
		April	0.0	>6.0	0.0-3.0	Very long	Occasional	---	None
		May	0.0	>6.0	0.0-3.0	Very long	Occasional	---	None
		June	0.0	>6.0	0.0-3.0	Very long	Occasional	---	None
		July	0.0	>6.0	0.0-3.0	Very long	Occasional	---	None
		August	0.0	>6.0	0.0-3.0	Very long	Occasional	---	None
		September	0.0	>6.0	0.0-3.0	Very long	Occasional	---	None
		October	0.0	>6.0	0.0-3.0	Very long	Occasional	---	None
		November	0.0	>6.0	0.0-3.0	Very long	Occasional	---	None
EdsB:									
Eda-----	A	Jan-Dec	---	---	---	---	None	---	None
EdsD:									
Eda-----	A	Jan-Dec	---	---	---	---	None	---	None
EdsF:									
Eda-----	A	Jan-Dec	---	---	---	---	None	---	None
FayB:									
Farry-----	B	Jan-Dec	---	---	---	---	None	---	None
FraB:									
Frankirk-----	C	Jan-Dec	---	---	---	---	None	---	None
GdfB:									
Grandfield-----	B	Jan-Dec	---	---	---	---	None	---	None
GfGB:									
Grandmore-----	B	January	3.3-5.0	5.0-6.0	---	---	None	---	None
		February	3.3-5.0	5.0-6.0	---	---	None	---	None
		March	3.3-5.0	5.0-6.0	---	---	None	---	None
		April	3.3-5.0	5.0-6.0	---	---	None	---	None
		May	3.3-5.0	5.0-6.0	---	---	None	---	None
		October	3.3-5.0	5.0-6.0	---	---	None	---	None
		November	3.3-5.0	5.0-6.0	---	---	None	---	None
		December	3.3-5.0	5.0-6.0	---	---	None	---	None
Grandfield-----	B	Jan-Dec	---	---	---	---	None	---	None

Soil Survey of Jackson County, Oklahoma

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
GlGB:									
Grandmore-----	B	January	3.3-5.0	5.0-6.0	---	---	None	---	None
		February	3.3-5.0	5.0-6.0	---	---	None	---	None
		March	3.3-5.0	5.0-6.0	---	---	None	---	None
		April	3.3-5.0	5.0-6.0	---	---	None	---	None
		May	3.3-5.0	5.0-6.0	---	---	None	---	None
		October	3.3-5.0	5.0-6.0	---	---	None	---	None
		November	3.3-5.0	5.0-6.0	---	---	None	---	None
		December	3.3-5.0	5.0-6.0	---	---	None	---	None
Grandfield-----	B	Jan-Dec	---	---	---	---	None	---	None
GlsB:									
Grandfield-----	B	Jan-Dec	---	---	---	---	None	---	None
GlsD:									
Grandfield-----	B	Jan-Dec	---	---	---	---	None	---	None
GmuA:									
Gracemont-----	C	January	0.5-1.5	>6.0	---	---	None	---	None
		February	0.5-1.5	>6.0	---	---	None	---	None
		March	0.5-1.5	>6.0	---	---	None	Very brief	Occasional
		April	0.5-1.5	>6.0	---	---	None	Very brief	Occasional
		May	0.5-1.5	>6.0	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		November	0.5-1.5	>6.0	---	---	None	---	None
		December	0.5-1.5	>6.0	---	---	None	---	None
GmwA:									
Gracemont-----	C	January	0.5-1.5	>6.0	---	---	None	---	None
		February	0.5-1.5	>6.0	---	---	None	---	None
		March	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		April	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		May	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		November	0.5-1.5	>6.0	---	---	None	---	None
		December	0.5-1.5	>6.0	---	---	None	---	None
GsEA:									
Gracemore-----	C	January	0.5-1.5	>6.0	---	---	None	---	None
		February	0.5-1.5	>6.0	---	---	None	---	None
		March	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		April	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		May	0.5-1.5	>6.0	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		November	0.5-1.5	>6.0	---	---	None	---	None
		December	0.5-1.5	>6.0	---	---	None	---	None

Soil Survey of Jackson County, Oklahoma

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
GsEA:									
Ezell-----	C	January	0.0	>6.0	0.0-1.0	Very long	Occasional	---	None
		February	0.0	>6.0	0.0-1.0	Very long	Occasional	---	None
		March	0.0	>6.0	0.0-1.0	Very long	Occasional	Very brief	Frequent
		April	0.0	>6.0	0.0-1.0	Very long	Occasional	Very brief	Frequent
		May	0.0	>6.0	0.0-1.0	Very long	Occasional	Very brief	Frequent
		June	0.0	>6.0	0.0-1.0	Very long	Occasional	Very brief	Frequent
		July	0.0-1.0	>6.0	---	---	None	Very brief	Frequent
		August	0.0-1.0	>6.0	---	---	None	Very brief	Frequent
		September	0.0-1.0	>6.0	---	---	None	---	None
		October	0.0	>6.0	0.0-1.0	Very long	Occasional	---	None
		November	0.0	>6.0	0.0-1.0	Very long	Occasional	---	None
		December	0.0	>6.0	0.0-1.0	Very long	Occasional	---	None
HdmA:									
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
HdmB:									
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
HdmC:									
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
HdmE:									
Hardeman-----	B	Jan-Dec	---	---	---	---	None	---	None
HeyB:									
Heatly-----	A	Jan-Dec	---	---	---	---	None	---	None
Hkfa:									
Headrick-----	B	January	1.7-3.3	4.2-6.0	---	---	None	---	None
		February	1.7-3.3	4.2-6.0	---	---	None	---	None
		March	1.7-3.3	4.2-6.0	---	---	None	---	None
		April	1.7-3.3	4.2-6.0	---	---	None	---	None
		May	1.7-3.3	4.2-6.0	---	---	None	---	None
		October	1.7-3.3	4.2-6.0	---	---	None	---	None
		November	1.7-3.3	4.2-6.0	---	---	None	---	None
		December	1.7-3.3	4.2-6.0	---	---	None	---	None
HksA:									
Headrick-----	B	January	1.7-3.3	4.2-6.0	---	---	None	---	None
		February	1.7-3.3	4.2-6.0	---	---	None	---	None
		March	1.7-3.3	4.2-6.0	---	---	None	---	None
		April	1.7-3.3	4.2-6.0	---	---	None	---	None
		May	1.7-3.3	4.2-6.0	---	---	None	---	None
		October	1.7-3.3	4.2-6.0	---	---	None	---	None
		November	1.7-3.3	4.2-6.0	---	---	None	---	None
		December	1.7-3.3	4.2-6.0	---	---	None	---	None
HolA:									
Hollister-----	D	Jan-Dec	---	---	---	---	None	---	None
HrAC:									
Harmon-----	D	Jan-Dec	---	---	---	---	None	---	None
Aspermont-----	B	Jan-Dec	---	---	---	---	None	---	None
JesC:									
Jester-----	A	Jan-Dec	---	---	---	---	None	---	None

Soil Survey of Jackson County, Oklahoma

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
JesF: Jester-----	A	Jan-Dec	---	---	---	---	None	---	None
KcRG: Knoco-----	D	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-----	D	Jan-Dec	---	---	---	---	None	---	None
KoBE: Knoco-----	D	Jan-Dec	---	---	---	---	None	---	None
Badland-----	D	Jan-Dec	---	---	---	---	None	---	None
LacB: La Casa-----	C	Jan-Dec	---	---	---	---	None	---	None
LDF: Landfill-----	---	Jan-Dec	---	---	---	---	None	---	None
LnuA: Lincoln-----	A	January	5.0-8.0	>6.0	---	---	None	---	None
		February	5.0-8.0	>6.0	---	---	None	---	None
		March	5.0-8.0	>6.0	---	---	None	---	None
		April	5.0-8.0	>6.0	---	---	None	Very brief	Occasional
		May	5.0-8.0	>6.0	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
		November	5.0-8.0	>6.0	---	---	None	---	None
		December	5.0-8.0	>6.0	---	---	None	---	None
LnWA: Lincoln-----	A	January	5.0-8.0	>6.0	---	---	None	---	None
		February	5.0-8.0	>6.0	---	---	None	---	None
		March	5.0-8.0	>6.0	---	---	None	---	None
		April	5.0-8.0	>6.0	---	---	None	Very brief	Frequent
		May	5.0-8.0	>6.0	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		October	---	---	---	---	None	Very brief	Frequent
		November	5.0-8.0	>6.0	---	---	None	---	None
		December	5.0-8.0	>6.0	---	---	None	---	None
Westola-----	B	April	---	---	---	---	None	Very brief	Frequent
		May	---	---	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		October	---	---	---	---	None	Very brief	Frequent
M-W: Water.									
MagA: Madge-----	B	Jan-Dec	---	---	---	---	None	---	None

Soil Survey of Jackson County, Oklahoma

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
MagB: Madge-----	B	Jan-Dec	---	---	---	---	None	---	None
MngA: Mangum-----	D	April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
		November	---	---	---	---	None	Very brief	Occasional
NipA: Nipsum-----	C	Jan-Dec	---	---	---	---	None	---	None
NOTCOM: Area not surveyed, access denied.									
OakA: Oakley-----	B	January	5.0-6.6	>6.0	---	---	None	---	None
		February	5.0-6.6	>6.0	---	---	None	---	None
		March	5.0-6.6	>6.0	---	---	None	---	None
		April	5.0-6.6	>6.0	---	---	None	---	None
		May	5.0-6.6	>6.0	---	---	None	---	None
		October	5.0-6.6	>6.0	---	---	None	---	None
		November	5.0-6.6	>6.0	---	---	None	---	None
		December	5.0-6.6	>6.0	---	---	None	---	None
OakB: Oakley-----	B	January	5.0-6.6	>6.0	---	---	None	---	None
		February	5.0-6.6	>6.0	---	---	None	---	None
		March	5.0-6.6	>6.0	---	---	None	---	None
		April	5.0-6.6	>6.0	---	---	None	---	None
		May	5.0-6.6	>6.0	---	---	None	---	None
		October	5.0-6.6	>6.0	---	---	None	---	None
		November	5.0-6.6	>6.0	---	---	None	---	None
		December	5.0-6.6	>6.0	---	---	None	---	None
OzkA: Ozark-----	B	January	3.3-5.0	5.0-8.0	---	---	None	---	None
		February	3.3-5.0	5.0-8.0	---	---	None	---	None
		March	3.3-5.0	5.0-8.0	---	---	None	---	None
		April	3.3-5.0	5.0-8.0	---	---	None	---	None
		May	3.3-5.0	5.0-8.0	---	---	None	---	None
		October	3.3-5.0	5.0-8.0	---	---	None	---	None
		November	3.3-5.0	5.0-8.0	---	---	None	---	None
		December	3.3-5.0	5.0-8.0	---	---	None	---	None
OzsA: Ozark-----	B	January	2.0-4.0	5.0-8.0	---	---	None	---	None
		February	2.0-4.0	5.0-8.0	---	---	None	---	None
		March	2.0-4.0	5.0-8.0	---	---	None	---	None
		April	2.0-4.0	5.0-8.0	---	---	None	---	None
		May	2.0-4.0	5.0-8.0	---	---	None	---	None
		October	2.0-4.0	5.0-8.0	---	---	None	---	None
		November	2.0-4.0	5.0-8.0	---	---	None	---	None
		December	2.0-4.0	5.0-8.0	---	---	None	---	None

Soil Survey of Jackson County, Oklahoma

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
PIT:									
Pits-----	D	Jan-Dec	---	---	---	---	None	---	None
RakA:									
Roark-----	C	Jan-Dec	---	---	---	---	None	---	None
RKBG:									
Rock outcrop-----	D	Jan-Dec	---	---	---	---	None	---	None
Brico-----	C	Jan-Dec	---	---	---	---	None	---	None
RKO:									
Rock outcrop-----	D	Jan-Dec	---	---	---	---	None	---	None
RuuA:									
Rups-----	C	January	1.5-3.5	>6.0	---	---	None	---	None
		February	1.5-3.5	>6.0	---	---	None	---	None
		March	1.5-3.5	>6.0	---	---	None	---	None
		April	1.5-3.5	>6.0	---	---	None	Very brief	Occasional
		May	1.5-3.5	>6.0	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	1.5-3.5	>6.0	---	---	None	Very brief	Occasional
		November	1.5-3.5	>6.0	---	---	None	---	None
		December	1.5-3.5	>6.0	---	---	None	---	None
RuWA:									
Rups-----	C	January	1.5-3.5	>6.0	---	---	None	---	None
		February	1.5-3.5	>6.0	---	---	None	---	None
		March	1.5-3.5	>6.0	---	---	None	---	None
		April	1.5-3.5	>6.0	---	---	None	Very brief	Frequent
		May	1.5-3.5	>6.0	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		October	1.5-3.5	>6.0	---	---	None	Very brief	Frequent
		November	1.5-3.5	>6.0	---	---	None	---	None
		December	1.5-3.5	>6.0	---	---	None	---	None
SkCC2:									
Spikebox-----	C	Jan-Dec	---	---	---	---	None	---	None
Cobb-----	B	Jan-Dec	---	---	---	---	None	---	None
SpDB:									
Springer-----	B	Jan-Dec	---	---	---	---	None	---	None
Devol-----	B	Jan-Dec	---	---	---	---	None	---	None
SurA:									
Spur-----	B	April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		October	---	---	---	---	None	Very brief	Rare

Soil Survey of Jackson County, Oklahoma

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			<i>Ft</i>	<i>Ft</i>	<i>Ft</i>				
SuuA:									
Spur-----	B	April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
SuwA:									
Spur-----	B	April	---	---	---	---	None	Very brief	Frequent
		May	---	---	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		October	---	---	---	---	None	Very brief	Frequent
TARD:									
Talpa-----	D	Jan-Dec	---	---	---	---	None	---	None
Aspermont-----	B	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop-----	D	Jan-Dec	---	---	---	---	None	---	None
TilA:									
Tillman-----	D	Jan-Dec	---	---	---	---	None	---	None
TilB:									
Tillman-----	D	Jan-Dec	---	---	---	---	None	---	None
TipA:									
Tipton-----	B	Jan-Dec	---	---	---	---	None	---	None
TlvB:									
Tilvern-----	D	Jan-Dec	---	---	---	---	None	---	None
TpFA:									
Tipton-----	B	Jan-Dec	---	---	---	---	None	---	None
TrwB:									
Treadway-----	D	Jan-Dec	---	---	---	---	None	---	None
UST:									
Ustorthents-----	D	Jan-Dec	---	---	---	---	None	---	None
VeKE:									
Vernon-----	D	Jan-Dec	---	---	---	---	None	---	None
Knoco-----	D	Jan-Dec	---	---	---	---	None	---	None
VerC:									
Vernon-----	D	Jan-Dec	---	---	---	---	None	---	None
VeTE:									
Vernon-----	D	Jan-Dec	---	---	---	---	None	---	None
Talpa-----	D								
W:									
Water.									

Soil Survey of Jackson County, Oklahoma

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
WodB: Woods-----	D	Jan-Dec	---	---	---	---	None	---	None
WslA: Westola-----	B	April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
WstA: Westola-----	B	April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		October	---	---	---	---	None	Very brief	Rare
WtlA: Westill-----	D	Jan-Dec	---	---	---	---	None	---	None
WtlB: Westill-----	D	Jan-Dec	---	---	---	---	None	---	None

Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
AcmA: Acme-----	---	---	---	---	---	---	None	High	Moderate
ArHF: Arnett-----	---	---	---	---	---	---	None	Low	Low
Hardeman-----	---	---	---	---	---	---	None	Low	Low
ArnB: Arnett-----	---	---	---	---	---	---	None	Low	Low
ArnC: Arnett-----	---	---	---	---	---	---	None	Low	Low
AsmB: Aspermont-----	Bedrock (densic)	40-60	---	Noncemented	---	---	None	Moderate	Low
AsmC: Aspermont-----	Bedrock (densic)	40-60	---	Noncemented	---	---	None	Moderate	Low
BekA: Beckman-----	---	---	---	---	---	---	None	High	Moderate
BfdB: Burford-----	Bedrock (densic)	40-60	---	Noncemented	---	---	None	Moderate	Low
BfdC: Burford-----	Bedrock (densic)	40-60	---	Noncemented	---	---	None	Moderate	Low
CobB: Cobb-----	Bedrock (paralithic)	20-40	---	Very weakly cemented	---	---	None	Moderate	Low
CVRD: Cottonwood-----	Bedrock (lithic)	3-14	---	Strongly cemented	---	---	None	High	High
Vinson-----	Bedrock (lithic)	20-40	---	Strongly cemented	---	---	None	Moderate	Low
Rock outcrop-----	Bedrock (lithic)	0-3	---	Strongly cemented	---	---	None	---	---

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
DAM: Dam-----	---	---	---	---	---	---	None	---	---
DcbB: Decobb-----	Bedrock (paralithic)	60-80	---	Extremely weakly cemented	---	---	None	Moderate	Low
DeSD: Devol-----	---	---	---	---	---	---	None	Low	Low
Springer-----	---	---	---	---	---	---	None	Low	Low
EatA: Eastall-----	---	---	---	---	---	---	None	High	Low
EdsB: Eda-----	---	---	---	---	---	---	None	Low	Moderate
EdsD: Eda-----	---	---	---	---	---	---	None	Low	Moderate
EdsF: Eda-----	---	---	---	---	---	---	None	Low	Moderate
FayB: Farry-----	---	---	---	---	---	---	None	Low	Low
FraB: Frankirk-----	---	---	---	---	---	---	None	High	Low
GdfB: Grandfield-----	---	---	---	---	---	---	None	Low	Low
GfGB: Grandmore-----	---	---	---	---	---	---	None	High	Low
Grandfield-----	---	---	---	---	---	---	None	Low	Low
GlGB: Grandmore-----	---	---	---	---	---	---	None	High	Low
Grandfield-----	---	---	---	---	---	---	None	Low	Low
GlsB: Grandfield-----	---	---	---	---	---	---	None	Low	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
GlsD: Grandfield-----	---	---	---	---	---	---	None	Low	Low
GmuA: Gracemont-----	---	---	---	---	---	---	None	High	High
GmwA: Gracemont-----	---	---	---	---	---	---	None	High	High
GsEA: Gracemore-----	---	---	---	---	---	---	None	High	High
Ezell-----	---	---	---	---	---	---	None	High	Low
HdmA: Hardeman-----	---	---	---	---	---	---	None	Low	Low
HdmB: Hardeman-----	---	---	---	---	---	---	None	Low	Low
HdmC: Hardeman-----	---	---	---	---	---	---	None	Low	Low
HdmE: Hardeman-----	---	---	---	---	---	---	None	Low	Low
HeyB: Heatly-----	---	---	---	---	---	---	None	Moderate	Low
Hkfa: Headrick-----	---	---	---	---	---	---	None	High	Low
HksA: Headrick-----	---	---	---	---	---	---	None	High	Low
HolA: Hollister-----	---	---	---	---	---	---	None	High	Low
HrAC: Harmon-----	Bedrock (paralithic)	6-18	---	Weakly cemented	---	---	None	High	Low
Aspermont-----	Bedrock (densic)	40-60	---	Noncemented	---	---	None	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
JesC: Jester-----	---	---	---	---	---	---	None	Low	Low
JesF: Jester-----	---	---	---	---	---	---	None	Low	Low
KcRG: Knoco-----	Bedrock (densic)	3-20	---	Noncemented	---	---	None	High	Low
Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	---	---	None	---	---
KoBE: Knoco-----	Bedrock (densic)	3-20	---	Noncemented	---	---	None	High	Low
Badland-----	Bedrock (densic)	0-3	---	Noncemented	---	---	None	High	Low
LacB: La Casa-----	---	---	---	---	---	---	None	High	Low
LDF: Landfill-----	---	---	---	---	---	---	None	---	---
LnuA: Lincoln-----	---	---	---	---	---	---	None	Low	Low
LnWA: Lincoln-----	---	---	---	---	---	---	None	Low	Low
Westola-----	---	---	---	---	---	---	None	Low	Low
M-W: Water.									
MagA: Madge-----	---	---	---	---	---	---	None	Low	Low
MagB: Madge-----	---	---	---	---	---	---	None	Low	Low
MngA: Mangum-----	---	---	---	---	---	---	None	High	Low
NipA: Nipsum-----	---	---	---	---	---	---	None	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
NOTCOM: Area not surveyed, access denied.									
OakA: Oakley-----	---	---	---	---	---	---	None	Moderate	Low
OakB: Oakley-----	---	---	---	---	---	---	None	Moderate	Low
OzkA: Ozark-----	---	---	---	---	---	---	None	Moderate	Low
OzsA: Ozark-----	---	---	---	---	---	---	None	High	Low
PIT: Pits-----	Bedrock (paralithic)	0-3	---	Weakly cemented	---	---	None	High	Low
RakA: Roark-----	---	---	---	---	---	---	None	High	Low
RKBG: Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	None	---	---
Brico-----	---	---	---	---	---	---	None	Moderate	Low
RKO: Rock outcrop-----	Bedrock (lithic)	0-0	---	Indurated	---	---	None	---	---
RuuA: Rups-----	---	---	---	---	---	---	None	High	Moderate
RuwA: Rups-----	---	---	---	---	---	---	None	High	Moderate
SkCC2: Spikebox-----	Bedrock (paralithic)	8-20	---	Very weakly cemented	---	---	None	Moderate	Low
Cobb-----	Bedrock (paralithic)	20-40	---	Very weakly cemented	---	---	None	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
SpDB: Springer-----	---	---	---	---	---	---	None	Low	Low
Devol-----	---	---	---	---	---	---	None	Low	Low
SurA: Spur-----	---	---	---	---	---	---	None	Moderate	Low
SuuA: Spur-----	---	---	---	---	---	---	None	Moderate	Low
SuwA: Spur-----	---	---	---	---	---	---	None	Moderate	Low
TARD: Talpa-----	Bedrock (lithic)	4-20	---	Indurated	---	---	None	High	Low
Aspermont-----	Bedrock (densic)	40-60	---	Noncemented	---	---	None	Moderate	Low
Rock outcrop-----	Bedrock (lithic)	0-3	---	Indurated	---	---	None	---	---
TilA: Tillman-----	Bedrock (densic)	80-120	---	Noncemented	---	---	None	High	Low
TilB: Tillman-----	Bedrock (densic)	80-120	---	Noncemented	---	---	None	High	Low
TipA: Tipton-----	---	---	---	---	---	---	None	Moderate	Low
TlvB: Tilvern-----	Bedrock (densic)	40-60	---	Noncemented	---	---	None	High	Low
TpfA: Tipton-----	---	---	---	---	---	---	None	Moderate	Low
TrwB: Treadway-----	---	---	---	---	---	---	None	High	High
UST: Ustorthents.									

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
VeKE: Vernon-----	Bedrock (densic)	20-40	---	Noncemented	---	---	None	High	Low
Knoco-----	Bedrock (densic)	3-20	---	Noncemented	---	---	None	High	Low
VerC: Vernon-----	Bedrock (densic)	20-40	---	Noncemented	---	---	None	High	Low
VeTE: Vernon-----	Bedrock (densic)	20-40	---	Noncemented	---	---	None	High	Low
Talpa-----	Bedrock (lithic)	4-20	---	Indurated	---	---	None	High	Low
W: Water.									
WodB: Woods-----	---	---	---	---	---	---	None	High	Low
WslA: Westola-----	---	---	---	---	---	---	None	Low	Low
WstA: Westola-----	---	---	---	---	---	---	None	Low	Low
WtlA: Westill-----	Bedrock (densic)	60-80	---	Noncemented	---	---	None	High	Low
WtlB: Westill-----	Bedrock (densic)	60-80	---	Noncemented	---	---	None	High	Low

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for agricultural waste management. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, reclamation material, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the potential of the soils for the use. Terms for limitation classes are *not limited*, *somewhat limited*, and *very limited*. Terms indicating the potential of the soils for a given use are *good*, *fair*, and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

About 300,000 acres in Jackson County, or nearly 60 percent of the county, is used for cultivated crops. The main crops are wheat and cotton, but alfalfa, grain sorghum, and peanuts also are grown.

Approximately 50,000 acres in Jackson County, or nearly 10 percent of the county, is used for tame pasture. Bermudagrass, Old World bluestem, and weeping lovegrass are the main grasses, but in recent years wheatgrass and orchardgrass also have been grown.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in the tables "Land Capability and Yields Per Acre of Crops" and "Land Capability and Yields Per Acre of Pasture." In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the tables.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop

residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Under good pasture management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

A pasture program is needed to provide the desired amount of forage during each month of the year. A study of the growth habits of the different plants is necessary to ensure adequate forage during each month. The months when various kinds of forage plants grow are indicated in figure 25 (page 328). The percent growth that can be safely grazed each month without substantially reducing the total yield is illustrated for each kind of plant.

Pasture yields are indicated in animal unit months (AUMs). An AUM is the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Crops other than those shown in the yield tables are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (USDA, 1961a). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. These levels indicate the degree and kinds of limitations affecting mechanized farming systems that produce the more commonly grown field crops, such as corn, small grain, cotton, hay, and field-grown vegetables. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

If properly managed, soils in classes 1, 2, 3, and 4 are suitable for the mechanized production of commonly grown field crops and for pasture and woodland. The degree of the soil limitations affecting the production of cultivated crops increases progressively from class 1 to class 4. The limitations can affect levels of production and the risk of permanent soil deterioration caused by erosion and other factors.

Soils in classes 5, 6, and 7 are generally not suited to the mechanized production of commonly grown field crops without special management, but they are suitable for plants that provide a permanent cover, such as grasses and trees. The severity of the soil limitations affecting crops increases progressively from class 5 to class 7. The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide guidance on the use of these soils as cropland.

Areas in class 8 are generally not suitable for crops, pasture, rangeland, or woodland. These areas may have potential for other uses, such as recreational facilities and wildlife habitat.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, e, w, s, or c, to the class numeral, for example, 2e. The letter e shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by w, s, or c because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields tables.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture (USDA, NRCS, National Soil Survey Handbook), is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or

other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland where these limitations are overcome by drainage measures, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

A total 346,488 acres in Jackson County, or about 66.3 percent of the county, meets the requirements for prime farmland. The map units in the survey area that are considered prime farmland are listed in the table "Prime Farmland." This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in the table "Acreage and Proportionate Extent of the Soils." The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Rangeland

Mark Moseley, Range Conservationist, Natural Resources Conservation Service, Stillwater, Oklahoma, helped prepare parts of this section.

In areas that have similar climate and topography, differences in the kind and amount of rangeland or forest understory vegetation are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Range is defined as land on which the native vegetation (the climax, or natural potential, plant community) is predominantly grasses, grasslike plants, forbs, and shrubs suitable for grazing and browsing. Range includes natural grasslands, savannas, many wetlands, some deserts, tundra, and areas of certain shrub and forb communities. Range receives no regular or frequent cultural treatment. The composition and production of the plant community are determined by soil, climate, topography, overstory canopy, and grazing management.

Native pasture is defined as land on which the potential natural (climax) vegetation is forest but which is used and managed primarily for the production of native forage plants. Native pasture includes cutover forestland and forestland that has been cleared and is managed for native or naturalized forage plants.

Approximately 75 percent of the annual production on rangeland grows in the period April through July, following spring and early summer rains. A secondary growth period may occur in the fall if sufficient moisture is available from fall rains. Droughts of varying length, however, are common in the county.

Before the county was settled, the vegetation evolved with periodic natural fires, droughts, migratory grazing by bison, and the impacts of many other wildlife species. The bison would heavily impact an area and then move to other grazing range.

Early settlement brought continuous grazing and eliminated much of the high-quality vegetation on most range sites. Areas that were once open range sites with a mixture of tall, mid, and short grasses and forbs are now covered with mesquite (or oak on some sandy sites) and with low successional grasses and forbs. The amount of forage currently produced may be less than half of that originally produced. Mesquite or oak has increased significantly on most sites because of overgrazing and the lack of prairie fires.

Remnants of the original plant species still occur on some of the rangeland in the county. Progressive grazing management will allow these high-quality plants to become reestablished without reseeding.

Approximately 125,000 acres in Jackson County, or nearly 25 percent of the county, is rangeland. The rangeland occurs mainly in the western part of the county and along the rivers and streams. The rest of the county is dominantly cropland and has only a few small areas of rangeland.

The county has four distinct types of rangeland. The first type is in the western part of the county. It is an area of very gently sloping to moderately sloping soils with common outcrops of dolomite or gypsum. In this area the soils are a mixture of two types. Some are clayey or loamy and are deep or very deep over claystone or shale bedrock. Others are loamy and are very shallow to moderately deep over dolomite or gypsum bedrock. The soils support mid, short, and a few tall grasses, and potential productivity is moderate. Most areas have been invaded by mesquite.

The second type of rangeland is in the west-central part of the county, in an area where the soils are clayey and are very shallow to deep over claystone or shale bedrock. This area is typified by steep escarpments and gently sloping or sloping badlands. These soils support short and mid grasses, and potential productivity is low because of a shallow root zone. Most areas have been invaded by mesquite.

The third type of rangeland is in the northeastern and southwestern parts of the county, in an area where the soils formed in very deep, loamy and sandy sediments. These soils are gently undulating and have hummocky sand dunes. They support tall and mid grasses and scattered woody species, and potential productivity is moderate or moderately high. Oak has invaded much of the area in the northeastern part of the county.

The fourth type of rangeland is on the flood plains and on side slopes along the rivers and streams throughout the county. The soils on the flood plains are mainly loamy, are slightly saline or moderately saline, and have a water table within 5 feet of the surface. These soils support grasses that are tolerant of moderate salinity and wetness and are moderately productive to highly productive. The soils on side slopes generally are loamy, support tall and mid grasses, and are moderately productive.

Most of the ranches and livestock farms in the county are cow-calf operations. There are some pure stocker enterprises, and some ranchers diversify their cow-calf operations with stockers to provide greater flexibility.

Several livestock operations supplement the grazing of native rangeland with introduced grasses, such as bermudagrass and 'Plains' bluestem. Forage crops also are used. Protein, hay, and small grain crops are used as supplemental livestock feed in winter.

The table "Rangeland Productivity and Characteristic Plant Communities" shows, for each soil that supports vegetation suitable for grazing, the ecological site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in this table follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The

hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

Many different ecological sites occur in the survey area. Over time, the combination of plants best suited to a particular soil and climate became dominant. If the soil is not excessively disturbed, this group of plants is the natural plant community for the site. Natural plant communities are not static but vary slightly from year to year and place to place.

The relationship between soils and vegetation was ascertained during this survey; thus, ecological sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important. The "Field Office Technical Guide," which is available at local offices of the Natural Resources Conservation Service, can provide specific information about ecological sites.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content. Figure 25 shows a typical growth curve for native vegetation and other forage. It indicates the percentage of total growth that occurs each month.

Characteristic vegetation consists of the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil. The plants are listed by common name. Under *composition*, the anticipated percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the "National Range and Pasture Handbook," which is available in local offices of the Natural Resources Conservation Service and on the Internet.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Soil Survey of Jackson County, Oklahoma

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
IMPROVED BERMUDAGRASS				5	25	35	20	10	5			
WEeping LOVEGRASS			3	20	25	20	15	6	11			
INTRODUCED BLUESTEM				3	15	26	22	18	10	1		
SMALL GRAIN GRAZEOUT	3	9	29	27	18				1	4	6	3
FORAGE SORGHUM						14	33	33	20			
NATIVE GRASS	1	1	2	10	20	27	16	8	5	2	2	1

Figure 25.—Typical growth curves for various kinds forage in Jackson County. The growth curve for each kind of forage indicates the percentage of the total annual growth that occurs each month.

Similarity Index

Similarity index indicates, by percentages ranging from 1 to 100 percent, the extent to which the present plant community resembles one of two other plant communities on an ecological site. A similarity index can be used to compare the present vegetation on an ecological site to the presumed historic vegetation for that site. This comparison provides a basis for understanding the extent and direction of changes that have differentiated the current vegetation from the historic vegetation. A similarity index of 70 would suggest that the present plant community has 70 percent of the presumed historic plant community for that site.

A similarity index also can be used as a measure of how near the current plant community is to the landowner's goal for the site. The management goal is not necessarily a similarity index of 100, as compared to the historic plant community. Therefore, the similarity index can represent the percentage of the plant community that resembles a desired plant community.

Abnormal disturbances that change the natural plant community include repeated overuse by livestock, excessive burning, erosion, and cultivation. Grazing animals select the most palatable plants. These plants will eventually die if they are continually grazed at an intensity that does not allow for recovery. A very severe disturbance can completely destroy the natural community. Under these conditions, the less desirable plants, such as annuals and weedlike plants, can increase in abundance. If the plant community and the soils have not deteriorated significantly, the plant community eventually can return to dominantly natural plants where proper range management is applied.

Knowledge of the ecological site is necessary as a basis for planning and applying the management needed to maintain or improve the desired plant community for selected uses. Such information is needed to support or maintain management objectives, planned grazing systems, stocking rates, suitable wildlife management practices, recreational uses, and the condition of watersheds.

Rangeland Management

Rangeland management requires knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the similarity index.

Effective range management conserves rainfall, enhances water quality, reduces the hazard of downstream flooding, improves yields, provides forage for livestock and wildlife, enhances recreational opportunities, and protects the soil. The main management concern is recognizing important changes in the plant cover or the rangeland trend which occur gradually and may be overlooked.

Each range manager should evaluate the type of plant community that best supports the ranch and then apply management and ecological principles to achieve the goals. The desired plant community should be within the capabilities of the land.

The primary range management practices used in Jackson County are prescribed grazing, stock-water developments, and fences. If undesirable plants become dominant, range seeding, brush management, or prescribed burning may be used.

Range management includes four major considerations:

1. *Proper grazing distribution*, which is achieved by managing livestock so that all parts of the grazing unit are grazed equally.
2. *Selective grazing*, which occurs because animals graze preferred plants to balance their diets. If selective grazing occurs repeatedly, the preferred plants are damaged.
3. *A proper stocking rate*, which is achieved by balancing animal numbers with forage production.
4. *Rest periods* during which grazed plants are given enough rest to recover and to maintain their growth.

It is important to remember that forage production is controlled by rainfall while composition is determined by grazing management.

Setting the stocking rate is not an exact science because there are influences from grazing management systems, season of use, mix of livestock, and seasonal forage production. Some rules of thumb, however, can be helpful. To maintain a nutritional cover of plants, about 50 percent of the annual growth of the key, or most important, grazing plants should remain at the end of the grazing season. Plants can be removed not only through grazing by livestock but also through grazing by rodents, insects, and wildlife and through the deterioration caused by climatic variations. Because of these factors, a safe initial stocking rate for livestock should be calculated on the basis of 25 percent of the total annual growth, by weight, of the vegetation.

For example, production could be 3,500 pounds per acre of air-dry grasses, forbs, and limited woody species on a Loamy Prairie ecological site where the similarity index between the present plant community and the historic plant community is more than 70 for an average season. Twenty-five percent of this is 875 pounds per acre.

A 1,000-pound cow and her calf is equivalent to one animal unit (AU) and will consume about 2.6 percent of her body weight (26 pounds) of forage per day. So, in one month, an animal unit will consume 790 pounds of native vegetation, depending on the quality and stage of growth of the plants (26 pounds per day times 365 days per year divided by 12 months per year).

Dividing 875 pounds (forage allocation) by 26 pounds (forage required per day for one animal unit) suggests that 1 acre of the Loamy Prairie ecological site with a similarity index of 70 will feed one cow for 33.6 days. To convert forage available from 1 acre to an animal unit month (AUM), the available forage (875 pounds) is divided by the amount required to feed an animal unit for 1 month (790 pounds). One acre will provide 1.1 AUM of grazing. Therefore, 10.9 acres will feed one cow for 12 months in this example. Another approach is to calculate the annual forage needs of an animal unit (790 pounds per month times 12 months equals 9,490 pounds). Dividing the 875

pounds of usable forage per acre into the 9,490 pounds needed by the cow reveals that approximately 10.9 acres is needed for one cow annually. Stocking rate calculation should be adjusted for animal size, grazing system, and grazing season.

More information about planning a grazing program is available from the local office of the Natural Resources Conservation Service.

Ecological Sites

The following paragraphs describe the ecological sites in Jackson County.

R078BY070TX, Clayey Bottomland PE 25-36.—This site is in areas of clayey, well drained soils on bottomland. The potential natural vegetation includes buffalograss, vine mesquite, western wheatgrass, and tobosa with lesser amounts of sideoats grama, blue grama, silver bluestem, white tridens, alkali sacaton, Canada wildrye, and other grasses and forbs. Productivity is low, and the site is easily overgrazed. Mesquite and pricklypear are common invaders.

R078BY072TX, Clay Loam PE 25-36.—This site is in areas of deep and very deep, well drained clays and clay loams. The potential natural vegetation includes sideoats grama, blue grama, tobosa, buffalograss, and vine mesquite with lesser amounts of Arizona cottontop, Texas wintergrass, and western wheatgrass. Forbs, such as Engelmann daisy, gaura, bushsunflower, and evening primrose, also occur. Mesquite, pricklypear, and lotebush are common invaders.

R078BY076TX, Gyp PE 25-36.—This site is in areas of shallow or very shallow, well drained, loamy soils over gypsum. Gypsum outcrops are common. The potential natural vegetation includes little bluestem, sideoats grama, and sand bluestem with lesser amounts of Indiangrass, tobosa, blue grama, buffalograss, and threeawns. Forbs include gayfeather, false broomweed, daleas, and fourwing saltbush. Mesquite, redberry juniper, and pricklypear are common invaders.

R078BY078TX, Lakebed PE 25-36.—This site is in areas of poorly drained clays on the bottom of enclosed depressions that are inundated for varying lengths of time. Vegetation varies widely, depending on the availability of water, and includes vine mesquite, buffalograss, white tridens, sedges, and miscellaneous grasses and forbs.

R078BY079TX, Loamy PE 25-36.—This site is in areas of moderately deep to very deep, well drained, loamy soils that have a high content of lime. The potential natural vegetation includes sideoats grama, little bluestem, sand bluestem, and buffalograss with lesser amounts of Indiangrass, switchgrass, blue grama, and other perennial grasses. Forbs include Engelmann daisy, heath aster, verbena, dotted gayfeather, and catclaw sensitivebrier. Invader plants include mesquite, pricklypear, lotebush, tasajillo, broom snakeweed, and threeawns.

R078BY080TX, Loamy Bottomland PE 25-36.—This site is in areas of loamy, well drained soils on bottomland. The potential natural vegetation includes sand bluestem, Indiangrass, switchgrass, and little bluestem with lesser amounts of eastern gamagrass, Canada wildrye, and miscellaneous perennial grasses and forbs. Buffalograss, blue grama, windmillgrass, and weeds indicate deterioration of the site.

R078BY090TX, Clay Prairie PE 25-36.—This site is in areas of moderately deep or deep, well drained, clayey soils over red-bed or shale bedrock. The potential natural vegetation is mainly sideoats grama, buffalograss, and tobosa with lesser amounts of blue grama, Texas wintergrass, silver bluestem, tridens, vine mesquite, threeawns, miscellaneous perennial grasses, and a wide variety of forbs. Mesquite, pricklypear, lotebush, and tasajillo are common invaders.

R078BY091TX, Very Shallow PE 25-36.—This site is in areas of hilly, gravelly, very shallow or shallow soils. The potential natural vegetation is mainly sideoats grama, little bluestem, and sand bluestem with lesser amounts of buffalograss, hairy grama, silver bluestem, slim tridens, and purple and Wright threeawns.

Bushsunflower, gray goldaster, daleas, gayfeather, plains blackfoot, sundrops, catclaw, ephedra, hackberry, and javelinabrush also occur.

R078BY092TX, Very Shallow Clay PE 25-36.—This site is in areas of shallow or very shallow, well drained, clayey, calcareous soils over soft shale bedrock. The potential natural vegetation is mostly sideoats grama with buffalograss, silver bluestem, and tobosa and lesser amounts of alkali sacaton, little bluestem, and sand bluestem. As regression from overgrazing occurs, buffalograss, threeawn, muhly, Texas grama, mesquite, pricklypear, and lotebush dominate the site. Further deterioration results in extensive bare ground and an invasion of annual grasses and forbs.

R078BY692TX, Rocky Hill PE 25-36.—This site is in areas of stony, calcareous clays and shaly soils on steep hillsides. The potential natural vegetation includes little and sand bluestems, Indiangrass, sideoats grama, Canada wildrye, vine mesquite, Texas wintergrass, tall dropseed, buffalograss, heath aster, bushsunflower, gayfeather, daleas, bumelia, hackberry, elm, skunkbush, and sumacs. Mesquite, tasajillo, lotebush, and pricklypear are common invaders.

R078CY017OK, Deep Sand Savannah.—This site is in areas of very deep, well drained, sandy soils. The potential natural vegetation includes little bluestem, sand bluestem, and shinnery oak with lesser amounts of Indiangrass, switchgrass, sand lovegrass, sand dropseed, Scribner panicum, and purpletop. Wild lespedezas and other legumes are common. Eastern redcedar is a common invader.

R078CY050OK, Loamy Bottomland.—This site is in areas of loamy, well drained soils on bottomland. The potential natural vegetation includes sand bluestem, Indiangrass, switchgrass, and little bluestem with lesser amounts of eastern gamagrass, Canada wildrye, and miscellaneous perennial grasses and forbs. Buffalograss, blue grama, windmillgrass, and weeds indicate deterioration of the site.

R078CY056OK, Loamy Prairie.—This site is in areas of deep or very deep, well drained, loamy soils. The potential natural vegetation includes little and sand bluestems, Indiangrass, switchgrass, and sideoats grama with lesser amounts of blue grama, buffalograss, tall dropseed, and other grasses. Forbs include leadplant, Illinois bundleflower, sunflower, and heath aster. Such species as sand dropseed, windmillgrass, silver bluestem, sand sagebrush, skunkbush, and hackberry also can occur.

R078CY057OK, Limy Prairie.—This site is in areas of deep or very deep, well drained, loamy soils that have a high content of lime. The potential natural vegetation includes little bluestem, sideoats grama, sand bluestem, and blue grama with lesser amounts of Indiangrass, switchgrass, buffalograss, and other perennial grasses. Forbs include Engelmann daisy, heath aster, verbena, dotted gayfeather, and catclaw sensitivebrier. Such plants as mesquite, pricklypear, and threeawns can occur. They indicate deterioration of the site.

R078CY064OK, Clay Flats.—This site is in areas of deep or very deep, well drained, clayey soils that have a very slight to moderate content of salts. Vegetation may be patchy, and bare spots are common. The potential natural vegetation includes buffalograss, blue grama, vine mesquite, and silver bluestem with lesser amounts of sideoats grama, western wheatgrass, tall dropseed, alkali sacaton, threeawns, and miscellaneous grasses and forbs. Productivity is low, and the site is easily overgrazed. Mesquite and pricklypear are common invaders.

R078CY089OK, Seep Meadow.—This site is in areas of very deep, somewhat poorly drained, loamy and sandy soils that have a high water table for part of most years. The potential natural vegetation includes switchgrass, sand bluestem, bushy bluestem, Indiangrass, and sedges with lesser amounts of muhly, bundleflower, buttonbush, and miscellaneous grasses and forbs. Willows and cottonwood trees also grow on this site.

R078CY096TX, Clay Loam PE 31-44.—This site is in areas of deep or very deep, well drained, clayey soils that have a surface layer of clay loam. The potential natural vegetation includes blue grama, buffalograss, sideoats grama, Arizona cottontop, and vine mesquite with lesser amounts of western wheatgrass, Texas wintergrass, little bluestem, and sand bluestem. Asters, catclaw sensitivebrier, Engelmann daisy, and ephedra also occur.

R078CY105TX, Loamy Sand Prairie PE 31-44.—This site is in areas of very deep, moderately well or well drained, loamy soils that have a surface layer of loamy sand. The potential natural vegetation includes sand bluestem, Indiangrass, little bluestem, and switchgrass with lesser amounts of sideoats grama, blue grama, sand lovegrass, and Canada wildrye. Heath aster, sagewort, hackberry, sand sagebrush, and plum also occur.

R078CY107TX, Sand Hills PE 25-36.—This site is in areas of very deep, excessively drained, sandy soils on hummocky sand dunes. The potential natural vegetation includes sand bluestem, little bluestem, giant sandreed, and switchgrass with lesser amounts of sand lovegrass, Canada wildrye, dropseeds, and other grasses. Primroses, guaras, daleas, plum, skunkbush sumac, and sand sagebrush also occur.

R078CY110TX, Sandy Loam Prairie PE 31-44.—This site is in areas of moderately deep to very deep, well drained, loamy soils that have a surface layer of sandy loam. The potential natural vegetation includes little bluestem, sand bluestem, sideoats grama, and blue grama with lesser amounts of Indiangrass, switchgrass, and sand lovegrass. Forbs include catclaw sensitivebrier, Engelmann daisy, gayfeather, and heath aster.

R078XY046OK, Saline Bottomland.—This site is in areas of very deep, somewhat poorly drained soils that are on level or slightly depressional flood plains and have a saline subsoil. The potential natural vegetation includes alkali sacaton, inland saltgrass, switchgrass, tall dropseed, vine mesquite, and western wheatgrass with lesser amounts of sedges and miscellaneous perennial grasses and forbs. Saltcedar is a nonnative woody invader.

R078XY068OK, Sandy Bottomland.—This site is in areas of sandy, well drained soils on bottomland. The potential natural vegetation includes sand bluestem, Indiangrass, switchgrass, little bluestem, eastern gamagrass, threeawns, and other perennial and annual grasses.

R078XY090OK, Meadow.—This site is in areas that are ponded for long periods but are usually without standing water during most of the growing season. The water table is within a few inches of the surface for a considerable part of the year. The potential natural vegetation includes grasses, sedges, rushes, buttonbush, and various broadleaf plants. Willows and cottonwood trees are common.

R078XY097OK, Subirrigated (Saline).—This site is in areas of sandy and loamy soils that are on bottomland, have a high water table, and have a slight to moderate content of salts. The site favors the growth of the more salt-tolerant species. The potential natural vegetation includes switchgrass, sand bluestem, Indiangrass, and alkali sacaton with lesser amounts of western wheatgrass, prairie cordgrass, sedges, Maximilian sunflower, alkali muhly, inland saltgrass, and eastern baccharis. Abusive grazing can result in an increase in the extent of grasses, such as inland saltgrass, alkali muhly, and silver bluestem. Saltcedar is a common nonnative invader.

R078XY834OK, Reseeded Sandy Land.—This site is in areas where sand bluestem and little bluestem are the most important grasses in the seeded cover. Less common are switchgrass, sand lovegrass, and Canada wildrye. Red lovegrass, gummy lovegrass, sand dropseed, and fall witchgrass are low serial stage plants. Annual wild buckwheat and sandbur are common.

R082BY004OK, Boulder Ridge.—This site is in areas of deep, gravelly soils that have small rocks on or near the surface. It is mostly along the lower slopes and

ridges near the Wichita Mountains. These soils take in water quickly and are productive. Big bluestem, Indiangrass, switchgrass, and little bluestem are important tall grasses. They make up about 70 percent of the forage production. The rest of the production can include sideoats grama, blue grama, hairy grama, dropseed, and forbs. Woody species include post oak and blackjack oak. The site is invaded by eastern redcedar.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Several rows of low and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Windbreaks commonly are planted on land that did not originally support trees. Knowledge of how trees perform on such land can be gained only by observing and recording the performance of planted trees that have survived. Many popular windbreak species are not indigenous to the areas in which they are planted. Each tree or shrub species has certain climatic and physiographic limits. Within these parameters, a tree or shrub may grow well or grow poorly, depending on the characteristics of the soil. Each tree or shrub has definable potential heights in a given physiographic area and under given climatic conditions. Accurate definitions of potential heights are necessary when a windbreak is planned and designed.

Trees are not part of the normal native vegetation on most soils in Jackson County because of limited moisture during the growing season, especially during periods when seedlings become established. If water is available, a drip irrigation system can provide adequate moisture for seedling establishment and continued survival. Also, providing a weed barrier or mulching around seedlings reduces surface heat, plant desiccation, and competition for moisture from weeds.

The table "Windbreaks and Environmental Plantings" shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in this table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in tables "Recreation, Part 1" and "Recreation, Part 2" according to limitations that affect their suitability for recreational uses. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance

can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in these tables can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large

stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, reclamation material, roadfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Sanitary Facilities

The tables "Sanitary Facilities, Part 1," and "Sanitary Facilities, Part 2" show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability,

depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow

along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The tables "Building Site Development, Part 1" and "Building Site Development, Part 2" show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility.

Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Construction Materials

The tables "Construction Materials, Part 1" and "Construction Materials, Part 2" give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated *good*, *fair*, or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials

are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a *probable* or *improbable* source of sand and gravel. A rating of *probable* means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table "Construction Materials, Part 1," only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by

slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

The table "Water Management" gives information on the degree and kind of soil limitations that affect pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

The tables "Agricultural Waste Management, Part 1" and "Agricultural Waste Management, Part 2" show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous

wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, soil erosion factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, soil erosion factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

Overland flow of wastewater is a process in which wastewater is applied to the upper reaches of sloped land and allowed to flow across vegetated surfaces, sometimes called terraces, to runoff-collection ditches. The length of the run generally is 150 to 300 feet. The application rate ranges from 2.5 to 16.0 inches per

week. It commonly exceeds the rate needed for irrigation of cropland. The wastewater leaves solids and nutrients on the vegetated surfaces as it flows downslope in a thin film. Most of the water reaches the collection ditch, some is lost through evapotranspiration, and a small amount may percolate to the ground water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, and the design and construction of the system. Reaction and the cation-exchange capacity affect absorption. Reaction, salinity, and the sodium adsorption ratio affect plant growth and microbial activity. Slope, permeability, depth to a water table, ponding, flooding, depth to bedrock or a cemented pan, stones, and cobbles affect design and construction. Permanently frozen soils are unsuitable for waste treatment.

Rapid infiltration of wastewater is a process in which wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil. The wastewater may eventually reach the ground water. The application rate commonly exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, the basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of the wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on the soil properties that affect the risk of pollution and the design, construction, and performance of the system. Depth to a water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance. Permanently frozen soils are unsuitable for waste treatment.

Slow rate treatment of wastewater is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, soil erosion factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Crops

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capa- bility	Alfalfa hay		Cotton lint		Grain sorghum		Peanuts		Wheat
		N	I	N	I	N	I	N	I	N
		Tons	Tons	Lbs	Lbs	Bu	Bu	Lbs	Lbs	Bu
Acma:										
Acme-----	3s	2.50	4.50	325.00	750.00	30.00	85.00	---	---	25.00
ArHF:										
Arnett-----	4e	---	---	---	---	---	---	---	---	---
Hardeman-----	6e	---	---	---	---	---	---	---	---	---
ArnB:										
Arnett-----	2e	2.50	---	250.00	---	30.00	---	---	---	28.00
ArnC:										
Arnett-----	3e	2.00	---	200.00	---	25.00	---	---	---	20.00
AsmB:										
Aspermont-----	3e	---	---	200.00	---	20.00	---	---	---	20.00
AsmC:										
Aspermont-----	4e	---	---	150.00	---	---	---	---	---	15.00
BekA:										
Beckman-----	4s	---	---	100.00	---	10.00	---	---	---	10.00
BfdB:										
Burford-----	3e	---	---	225.00	---	22.00	---	---	---	20.00
BfdC:										
Burford-----	4e	---	---	175.00	---	---	---	---	---	15.00
CobB:										
Cobb-----	3e	2.00	---	225.00	---	25.00	---	---	---	20.00
CVRD:										
Cottonwood-----	7s	---	---	---	---	---	---	---	---	---
Vinson-----	3e	---	---	---	---	---	---	---	---	---
Rock outcrop-----	8s	---	---	---	---	---	---	---	---	---
DAM:										
Dam-----	8s	---	---	---	---	---	---	---	---	---
DcbB:										
Decobb-----	2e	2.80	5.50	300.00	850.00	35.00	85.00	---	---	30.00
DeSD:										
Devol-----	4e	2.00	---	175.00	---	20.00	---	1,000.00	2,500.00	18.00
Springer-----	4e	2.20	---	225.00	---	25.00	---	1,000.00	2,500.00	22.00
EatA:										
Eastall-----	3w	---	---	---	---	25.00	---	---	---	18.00
EdsB:										
Eda-----	3e	2.00	---	150.00	---	20.00	---	1,000.00	2,500.00	18.00

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capa- bility	Alfalfa hay		Cotton lint		Grain sorghum		Peanuts		Wheat
	N	N	I	N	I	N	I	N	I	N
		<i>Tons</i>	<i>Tons</i>	<i>Lbs</i>	<i>Lbs</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Lbs</i>	<i>Bu</i>
EdsD: Eda-----	4e	---	---	---	---	---	---	900.00	2,100.00	12.00
EdsF: Eda-----	6e	---	---	---	---	---	---	---	---	---
FayB: Farry-----	2e	2.80	---	325.00	---	35.00	---	1,100.00	3,100.00	30.00
FraB: Frankirk-----	2e	2.50	---	350.00	900.00	35.00	100.00	---	---	35.00
GdfB: Grandfield-----	2e	3.00	5.50	300.00	750.00	30.00	85.00	1,100.00	3,100.00	28.00
GfGB: Grandmore-----	2e	3.20	6.00	325.00	750.00	35.00	85.00	1,200.00	3,200.00	30.00
Grandfield-----	2e	3.00	6.00	300.00	750.00	30.00	85.00	1,100.00	3,100.00	28.00
GlGB: Grandmore-----	3e	3.20	5.50	300.00	700.00	30.00	85.00	1,200.00	3,200.00	28.00
Grandfield-----	3e	3.00	5.50	275.00	700.00	30.00	85.00	1,100.00	3,100.00	25.00
GlsB: Grandfield-----	3e	3.00	5.50	275.00	700.00	30.00	85.00	1,100.00	3,100.00	25.00
GlsD: Grandfield-----	4e	2.50	---	225.00	---	25.00	---	1,100.00	2,800.00	20.00
GmuA: Gracemont-----	4s	---	---	100.00	---	---	---	---	---	15.00
GmwA: Gracemont-----	5s	---	---	---	---	---	---	---	---	---
GsEA: Gracemore-----	5s	---	---	---	---	---	---	---	---	---
Ezell-----	5w	---	---	---	---	---	---	---	---	---
HdmA: Hardeman-----	2e	2.50	6.50	300.00	700.00	35.00	80.00	1,100.00	3,500.00	30.00
HdmB: Hardeman-----	3e	2.50	6.50	275.00	625.00	30.00	75.00	1,100.00	3,200.00	28.00
HdmC: Hardeman-----	3e	2.20	---	225.00	---	25.00	---	900.00	---	22.00
HdmE: Hardeman-----	6e	---	---	---	---	---	---	---	---	---
HeyB: Heatly-----	4e	3.00	5.50	275.00	---	30.00	85.00	1,100.00	3,100.00	25.00
Hkfa: Headrick-----	2e	2.00	---	300.00	---	30.00	---	1,100.00	3,100.00	28.00
HksA: Headrick-----	3e	2.00	---	275.00	---	30.00	---	1,100.00	3,100.00	25.00

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capa- bility	Alfalfa hay		Cotton lint		Grain sorghum		Peanuts		Wheat
	N	N	I	N	I	N	I	N	I	N
		<i>Tons</i>	<i>Tons</i>	<i>Lbs</i>	<i>Lbs</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Lbs</i>	<i>Bu</i>
HolA:										
Hollister-----	2c	---	---	325.00	1,000.00	35.00	100.00	---	---	35.00
HrAC:										
Harmon-----	6s	---	---	---	---	---	---	---	---	5.00
Aspermont-----	4e	---	---	150.00	---	15.00	---	---	---	15.00
JesC:										
Jester-----	4e	---	---	---	---	---	---	---	---	---
JesF:										
Jester-----	6e	---	---	---	---	---	---	---	---	---
KcRG:										
Knoco-----	7s	---	---	---	---	---	---	---	---	---
Rock outcrop-----	8s	---	---	---	---	---	---	---	---	---
KoBE:										
Knoco-----	6s	---	---	---	---	---	---	---	---	---
Badland-----	8s	---	---	---	---	---	---	---	---	---
LacB:										
La Casa-----	2e	---	---	250.00	850.00	30.00	---	---	---	28.00
LDF:										
Landfill-----	8s	---	---	---	---	---	---	---	---	---
LnuA:										
Lincoln-----	3s	1.50	---	---	---	20.00	---	900.00	2,100.00	15.00
LnWA:										
Lincoln-----	5w	---	---	---	---	---	---	---	---	---
Westola-----	5w	---	---	---	---	---	---	---	---	---
M-W:										
Water.										
MagA:										
Madge-----	2c	3.00	6.00	400.00	1,000.00	45.00	110.00	---	---	40.00
MagB:										
Madge-----	2e	2.80	6.00	350.00	900.00	40.00	100.00	---	---	35.00
MngA:										
Mangum-----	2w	---	---	225.00	---	25.00	---	---	---	20.00
NipA:										
Nipsum-----	2c	---	---	300.00	1,000.00	35.00	95.00	---	---	30.00
NOTCOM:										
Area not surveyed, access denied.										
OakA:										
Oakley-----	2e	2.30	---	300.00	---	30.00	---	---	---	25.00

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capa- bility	Alfalfa hay		Cotton lint		Grain sorghum		Peanuts		Wheat
	N	N	I	N	I	N	I	N	I	N
		<i>Tons</i>	<i>Tons</i>	<i>Lbs</i>	<i>Lbs</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Lbs</i>	<i>Bu</i>
OakB: Oakley-----	3e	2.00	---	275.00	---	25.00	---	---	---	22.00
OzkA: Ozark-----	2e	3.50	6.00	375.00	900.00	40.00	100.00	1,200.00	3,500.00	35.00
OzsA: Ozark-----	4s	---	---	---	---	15.00	---	---	---	15.00
PIT: Pits-----	8s	---	---	---	---	---	---	---	---	---
RakA: Roark-----	2c	3.50	6.50	450.00	1,000.00	45.00	110.00	---	---	40.00
RKBG: Rock outcrop-----	8s	---	---	---	---	---	---	---	---	---
Brico-----	7s	---	---	---	---	---	---	---	---	---
RKO: Rock outcrop-----	8s	---	---	---	---	---	---	---	---	---
RuuA: Rups-----	4s	---	---	150.00	---	15.00	---	---	---	15.00
RuWA: Rups-----	5w	---	---	---	---	---	---	---	---	---
SkCC2: Spikebox-----	6s	---	---	---	---	---	---	---	---	8.00
Cobb-----	3e	1.00	---	---	---	15.00	---	---	---	15.00
SpDB: Springer-----	3e	2.70	---	275.00	---	30.00	---	1,100.00	2,700.00	25.00
Devol-----	3e	2.50	---	250.00	---	25.00	---	1,100.00	2,700.00	22.00
SurA: Spur-----	2c	4.20	6.50	450.00	1,000.00	45.00	110.00	---	---	40.00
SuuA: Spur-----	2w	3.50	6.00	400.00	1,000.00	40.00	110.00	---	---	35.00
SuwA: Spur-----	5w	---	---	---	---	---	---	---	---	---
TARD: Talpa-----	7s	---	---	---	---	---	---	---	---	---
Aspermont-----	4e	---	---	---	---	---	---	---	---	---
Rock outcrop-----	8s	---	---	---	---	---	---	---	---	---
TilA: Tillman-----	2s	---	---	300.00	900.00	35.00	95.00	---	---	30.00
TilB: Tillman-----	3e	---	---	275.00	850.00	30.00	90.00	---	---	28.00

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capa- bility	Alfalfa hay		Cotton lint		Grain sorghum		Peanuts		Wheat
	N	N	I	N	I	N	I	N	I	N
		<i>Tons</i>	<i>Tons</i>	<i>Lbs</i>	<i>Lbs</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Lbs</i>	<i>Bu</i>
TipA: Tipton-----	2c	4.00	6.50	450.00	1,000.00	45.00	110.00	---	---	40.00
TlvB: Tilvern-----	3e	---	---	175.00	---	15.00	---	---	---	20.00
TpfA: Tipton-----	2e	4.20	6.50	450.00	1,000.00	45.00	110.00	1,200.00	3,500.00	40.00
TrwB: Treadway-----	6s	---	---	---	---	10.00	---	---	---	10.00
UST: Ustorthents-----	8s	---	---	---	---	---	---	---	---	---
VeKE: Vernon-----	6e	---	---	---	---	---	---	---	---	---
Knoco-----	6s	---	---	---	---	---	---	---	---	---
VerC: Vernon-----	3e	---	---	125.00	---	10.00	---	---	---	13.00
VeTE: Vernon-----	6e	---	---	---	---	---	---	---	---	---
Talpa-----	7s	---	---	---	---	---	---	---	---	---
W: Water.										
WodB: Woods-----	3e	---	---	275.00	---	25.00	---	---	---	25.00
WslA: Westola-----	2w	4.20	6.50	375.00	750.00	35.00	100.00	1,100.00	3,200.00	30.00
WstA: Westola-----	2e	4.50	6.50	400.00	900.00	35.00	100.00	1,100.00	3,200.00	35.00
WtlA: Westill-----	2s	---	---	250.00	900.00	30.00	90.00	---	---	28.00
WtlB: Westill-----	3e	---	---	225.00	850.00	25.00	85.00	---	---	25.00

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Pasture

(Yields and land capability subclasses are for nonirrigated areas. The yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capab- ility	Improved bermuda- grass	Intro- duced bluestem	Small grains grazeout	Grazed sorghum	Weeping lovegrass
		AUM	AUM	AUM	AUM	AUM
AcmA: Acme-----	3s	4.50	4.00	2.60	4.70	---
ArHF: Arnett-----	4e	3.50	4.10	---	---	4.00
Hardeman-----	6e	3.50	3.80	---	---	4.00
ArnB: Arnett-----	2e	5.00	4.10	3.00	4.70	5.00
ArnC: Arnett-----	3e	4.50	4.10	2.10	3.90	4.50
AsmB: Aspermont-----	3e	---	2.90	2.10	3.90	---
AsmC: Aspermont-----	4e	---	2.90	1.60	2.80	---
BekA: Beckman-----	4s	3.00	---	1.10	2.00	---
BfdB: Burford-----	3e	3.50	3.50	2.10	3.40	---
BfdC: Burford-----	4e	3.00	3.50	1.60	2.80	---
CobB: Cobb-----	3e	3.50	4.00	2.10	3.90	4.50
CVRD: Cottonwood-----	7s	---	---	---	---	---
Vinson-----	3e	---	---	---	---	---
Rock outcrop-----	8s	---	---	---	---	---
DAM: Dam-----	8s	---	---	---	---	---
DcbB: Decobb-----	2e	5.00	4.20	3.20	5.50	5.50
DeSD: Devol-----	4e	4.50	---	1.90	3.10	5.00
Springer-----	4e	4.75	---	2.30	3.90	5.00
EatA: Eastall-----	3w	4.00	---	1.90	3.90	---
EdsB: Eda-----	3e	4.00	---	1.90	3.10	5.00
EdsD: Eda-----	4e	3.50	---	1.30	---	4.50

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capab- ility	Improved bermuda- grass	Intro- duced bluestem	Small grains grazeout	Grazed sorghum	Weeping lovegrass
		<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>	<i>AUM</i>
EdsF: Eda-----	6e	---	---	---	---	3.50
FayB: Farry-----	2e	5.50	4.40	3.20	5.50	---
FraB: Frankirk-----	2e	5.00	4.00	3.50	5.50	---
GdfB: Grandfield-----	2e	5.50	4.20	3.00	4.70	5.50
GfGB: Grandmore-----	2e	6.00	4.20	3.20	5.50	5.50
	2e	5.50	4.20	3.00	4.70	5.50
GlGB: Grandmore-----	3e	6.00	---	3.00	4.70	6.00
	3e	5.50	---	2.60	4.70	6.00
GlsB: Grandfield-----	3e	5.50	---	2.60	4.70	6.00
GlsD: Grandfield-----	4e	5.00	---	2.10	3.90	5.50
GmuA: Gracemont-----	4s	5.50	---	1.60	---	---
GmwA: Gracemont-----	5s	5.50	---	---	---	---
GsEA: Gracemore-----	5s	5.00	---	---	---	---
Ezell-----	5w	---	---	---	---	---
HdmA: Hardeman-----	2e	5.00	4.00	3.20	5.50	5.50
HdmB: Hardeman-----	3e	5.00	4.00	3.00	4.70	5.50
HdmC: Hardeman-----	3e	4.50	4.00	2.30	3.90	5.00
HdmE: Hardeman-----	6e	4.00	3.80	---	---	4.50
HeyB: Heatly-----	4e	5.00	---	2.60	4.70	4.00
Hkfa: Headrick-----	2e	6.50	---	3.00	4.70	---
HksA: Headrick-----	3e	6.50	---	2.60	4.70	---

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capab- ility	Improved bermuda- grass	Intro- duced bluestem	Small grains grazeout	Grazed sorghum	Weeping lovegrass
		AUM	AUM	AUM	AUM	AUM
HolA: Hollister-----	2c	4.50	4.30	3.50	5.50	---
HrAC: Harmon-----	6s	---	2.40	0.60	---	---
Aspermont-----	4e	---	2.90	1.60	2.30	---
JesC: Jester-----	4e	3.00	---	---	---	3.50
JesF: Jester-----	6e	---	---	---	---	---
KcRG: Knoco-----	7s	---	---	---	---	---
Rock outcrop-----	8s	---	---	---	---	---
KoBE: Knoco-----	6s	---	---	---	---	---
Badland-----	8s	---	---	---	---	---
LacB: La Casa-----	2e	---	4.10	3.00	4.70	---
LDF: Landfill-----	8s	---	---	---	---	---
LnuA: Lincoln-----	3s	4.50	---	1.60	3.10	4.00
LnWA: Lincoln-----	5w	4.50	---	---	---	4.50
Westola-----	5w	7.00	---	---	---	7.00
M-W: Water.						
MagA: Madge-----	2c	6.00	4.00	4.00	7.00	---
MagB: Madge-----	2e	5.50	4.00	3.50	6.30	---
MngA: Mangum-----	2w	3.50	6.80	2.10	3.90	---
NipA: Nipsum-----	2c	---	4.40	3.20	5.50	---
NOTCOM: Area not surveyed, access denied.						
OakA: Oakley-----	2e	4.50	3.20	2.60	4.70	---
OakB: Oakley-----	3e	4.00	3.20	2.30	3.90	---

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capab- ility	Improved bermuda- grass	Intro- duced bluestem	Small grains grazeout	Grazed sorghum	Weeping lovegrass
		AUM	AUM	AUM	AUM	AUM
OzkA: Ozark-----	2e	6.00	4.50	3.50	6.30	6.00
OzsA: Ozark-----	4s	3.00	---	1.60	2.30	---
PIT: Pits-----	8s	---	---	---	---	---
RakA: Roark-----	2c	5.50	4.40	4.00	7.00	---
RKBG: Rock outcrop-----	8s	---	---	---	---	---
Brico-----	7s	---	---	---	---	---
RKO: Rock outcrop-----	8s	---	---	---	---	---
RuuA: Rups-----	4s	5.00	---	1.60	2.30	---
RuwA: Rups-----	5w	4.00	---	---	---	---
SkCC2: Spikebox-----	6s	1.50	3.60	0.90	1.50	1.00
Cobb-----	3e	3.50	3.80	1.60	2.30	3.50
SpDB: Springer-----	3e	5.25	---	2.80	4.50	5.50
Devol-----	3e	5.00	---	2.30	3.90	5.50
SurA: Spur-----	2c	6.50	8.90	4.00	7.00	---
SuuA: Spur-----	2w	6.00	8.90	3.50	6.30	---
SuwA: Spur-----	5w	---	8.90	---	---	---
TARD: Talpa-----	7s	---	---	---	---	---
Aspermont-----	4e	---	---	---	---	---
Rock outcrop-----	8s	---	---	---	---	---
TilA: Tillman-----	2s	---	4.00	3.20	5.50	---
TilB: Tillman-----	3e	3.50	4.00	3.00	4.70	---
TipA: Tipton-----	2c	6.00	4.40	4.00	7.00	---
TlvB: Tilvern-----	3e	---	3.40	2.10	2.80	---

Soil Survey of Jackson County, Oklahoma

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Land capab- ility	Improved bermuda- grass	Intro- duced bluestem	Small grains grazeout	Grazed sorghum	Weeping lovegrass
		AUM	AUM	AUM	AUM	AUM
TpFA: Tipton-----	2e	6.50	5.00	4.00	7.00	6.00
TrwB: Treadway-----	6s	---	2.80	1.10	2.00	---
UST: Ustorthents-----	8s	---	---	---	---	---
VeKE: Vernon-----	6e	---	3.30	---	---	---
Knoco-----	6s	---	2.40	---	---	---
VerC: Vernon-----	3e	---	3.30	1.40	2.00	---
VeTE: Vernon-----	6e	---	3.30	---	---	---
Talpa-----	7s	---	2.50	---	---	---
W: Water.						
WodB: Woods-----	3e	3.50	3.20	2.60	3.90	---
WslA: Westola-----	2w	7.00	7.70	3.20	5.50	7.50
WstA: Westola-----	2e	7.00	7.70	3.50	5.50	7.50
WtlA: Westill-----	2s	---	3.90	3.00	4.70	---
WtlB: Westill-----	3e	---	3.90	2.60	3.90	---

Soil Survey of Jackson County, Oklahoma

Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland.)

Map symbol	Soil name
ArnB	Arnett sandy loam, 1 to 3 percent slopes
ArnC	Arnett sandy loam, 3 to 5 percent slopes
AsmB	Aspermont silt loam, 1 to 3 percent slopes
AsmC	Aspermont silt loam, 3 to 5 percent slopes
BfdB	Burford loam, 1 to 3 percent slopes
BfdC	Burford loam, 3 to 5 percent slopes
CobB	Cobb fine sandy loam, 1 to 3 percent slopes
DcbB	Decobb very fine sandy loam, 1 to 3 percent slopes
FayB	Farry fine sandy loam, 1 to 3 percent slopes
FraB	Frankirk loam, 1 to 3 percent slopes
GdFB	Grandfield fine sandy loam, 1 to 3 percent slopes
GfGB	Grandmore and Grandfield fine sandy loams, 1 to 3 percent slopes
GLGB	Grandmore and Grandfield loamy sands, 0 to 3 percent slopes
GLsB	Grandfield loamy sand, 0 to 3 percent slopes
GLsD	Grandfield loamy sand, 3 to 8 percent slopes
HdmA	Hardeman fine sandy loam, 0 to 1 percent slopes
HdmB	Hardeman fine sandy loam, 1 to 3 percent slopes
HdmC	Hardeman fine sandy loam, 3 to 5 percent slopes
HolA	Hollister silty clay loam, 0 to 1 percent slopes
LacB	La Casa silty clay loam, 1 to 3 percent slopes
MagA	Madge loam, 0 to 1 percent slopes
MagB	Madge loam, 1 to 3 percent slopes
NipA	Nipsum silty clay loam, 0 to 1 percent slopes
OakA	Oakley loam, 0 to 1 percent slopes
OakB	Oakley loam, 1 to 3 percent slopes
OzKA	Ozark fine sandy loam, 0 to 1 percent slopes
RakA	Roark loam, 0 to 1 percent slopes
SurA	Spur clay loam, 0 to 1 percent slopes, rarely flooded
SuuA	Spur clay loam, 0 to 1 percent slopes, occasionally flooded
TilA	Tillman clay loam, 0 to 1 percent slopes
TilB	Tillman clay loam, 1 to 3 percent slopes
TipA	Tipton loam, 0 to 1 percent slopes
TpFA	Tipton fine sandy loam, 0 to 1 percent slopes
WodB	Woods clay loam, 1 to 3 percent slopes
WslA	Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded
WstA	Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded
WtlA	Westill clay loam, 0 to 1 percent slopes
WtlB	Westill clay loam, 1 to 3 percent slopes

Rangeland Productivity and Characteristic Plant Communities

(Rangeland information is given only for soils that support rangeland vegetation suitable for grazing.)

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
AcmA: Acme-----	Loamy PE 25-36 R078BY079TX	3,700	3,000	2,200	Sideoats grama----- Little bluestem----- Miscellaneous perennial grasses Buffalograss----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Blue grama----- Switchgrass-----	25 15 15 10 10 10 5 5 5
ArHF: Arnett-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	4,000	2,800	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
Hardeman-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	3,000	2,400	1,800	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
ArnB: Arnett-----	Sandy Loam Prairie PE 31-44 R078CY110TX	4,000	3,200	2,400	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
ArnC: Arnett-----	Sandy Loam Prairie PE 31-44 R078CY110TX	4,000	3,200	2,400	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
AsmB: Aspermont-----	Loamy PE 25-36 R078BY079TX	3,500	2,800	2,000	Sideoats grama----- Little bluestem----- Miscellaneous perennial grasses Buffalograss----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Blue grama----- Switchgrass-----	25 15 15 10 10 10 5 5 5
AsmC: Aspermont-----	Loamy PE 25-36 R078BY079TX	3,500	2,800	2,000	Sideoats grama----- Little bluestem----- Miscellaneous perennial grasses Buffalograss----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Blue grama----- Switchgrass-----	25 15 15 10 10 10 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
BekA: Beckman-----	Saline Bottomland R078XY046OK	3,500	2,500	1,500	Alkali sacaton----- Miscellaneous perennial grasses Inland saltgrass----- Miscellaneous perennial forbs-- Switchgrass----- Tall dropseed----- Vine mesquite----- Western wheatgrass-----	55 15 5 5 5 5 5 5
BfdB: Burford-----	Limy Prairie R078CY057OK	3,800	3,000	2,300	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Buffalograss----- Switchgrass-----	20 20 15 10 10 10 5 5 5
BfdC: Burford-----	Limy Prairie R078CY057OK	3,800	3,000	2,300	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Buffalograss----- Switchgrass-----	20 20 15 10 10 10 5 5 5
CobB: Cobb-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	3,500	2,750	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
CVRD: Cottonwood-----	Gyp PE 25-36 R078BY076TX	1,800	1,100	400	Little bluestem----- Sideoats grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Blue grama----- Buffalograss----- Miscellaneous perennial grasses Miscellaneous shrubs----- Threeawn----- Tobosa-----	25 20 10 10 5 5 5 5 5 5 5
Vinson-----	Loamy PE 25-36 R078BY079TX	3,300	2,600	1,800	Sideoats grama----- Little bluestem----- Miscellaneous perennial grasses Buffalograss----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Blue grama----- Switchgrass-----	25 15 15 10 10 10 5 5 5
Rock outcrop.						
DAM: Dam.						
DcbB: Decobb-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	4,000	3,200	2,400	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
DeSD: Devol-----	Loamy Sand Prairie PE 31- 44 R078CY105TX	4,500	3,500	2,500	Sand bluestem----- Little bluestem----- Indiangrass----- Switchgrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand lovegrass----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5
Springer-----	Loamy Sand Prairie PE 31- 44 R078CY082TX	4,600	3,600	2,600	Sand bluestem----- Little bluestem----- Indiangrass----- Switchgrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand lovegrass----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5
EatA: Eastall-----	Lakebed PE 25-36 R078BY078TX	4,000	2,500	500	Vine mesquite----- Buffalograss----- Knotgrass----- Other annual forbs----- Sedge----- White tridens----- Annual grasses----- Miscellaneous perennial forbs--	30 20 10 10 10 10 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		<i>Lb/acre</i>	<i>Lb/acre</i>	<i>Lb/acre</i>		<i>Pct</i>
EdsB: Eda-----	Deep Sand Savannah R078CY017OK	3,600	2,500	1,700	Little bluestem----- Sand bluestem----- Havard's oak----- Indiangrass----- Scribner panicum----- Miscellaneous perennial grasses Miscellaneous shrubs----- Purpletop tridens----- Sand dropseed----- Sand lovegrass----- Switchgrass-----	25 20 15 5 5 5 5 5 5 5 5
EdsD: Eda-----	Deep Sand Savannah R078CY017OK	3,600	2,500	1,700	Little bluestem----- Sand bluestem----- Havard's oak----- Indiangrass----- Scribner panicum----- Miscellaneous perennial grasses Miscellaneous shrubs----- Purpletop tridens----- Sand dropseed----- Sand lovegrass----- Switchgrass-----	25 20 15 5 5 5 5 5 5 5 5
EdsF: Eda-----	Deep Sand Savannah R078CY017OK	3,400	2,300	1,500	Little bluestem----- Sand bluestem----- Havard's oak----- Indiangrass----- Scribner panicum----- Miscellaneous perennial grasses Miscellaneous shrubs----- Purpletop tridens----- Sand dropseed----- Sand lovegrass----- Switchgrass-----	25 20 15 5 5 5 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FayB: Farry-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	4,000	3,200	2,400	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
FraB: Frankirk-----	Loamy Prairie R078CY056OK	5,500	4,000	2,500	Little bluestem----- Indiangrass----- Sand bluestem----- Sideoats grama----- Switchgrass----- Blue grama----- Buffalograss----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Tall dropseed-----	25 15 15 10 10 5 5 5 5 5
GdfB: Grandfield-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	4,000	3,200	2,400	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
GfGB: Grandmore-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	4,500	3,500	2,600	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GfGB: Grandfield-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	4,000	3,200	2,400	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
G1GB: Grandmore-----	Loamy Sand Prairie PE 31- 44 R078CY105TX	5,000	4,000	3,000	Sand bluestem----- Little bluestem----- Indiangrass----- Switchgrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand lovegrass----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5
Grandfield-----	Loamy Sand Prairie PE 31- 44 R078CY105TX	4,800	3,800	2,800	Sand bluestem----- Little bluestem----- Indiangrass----- Switchgrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand lovegrass----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GlsB: Grandfield-----	Loamy Sand Prairie PE 31- 44 R078CY105TX	4,800	3,800	2,800	Sand bluestem----- Little bluestem----- Indiangrass----- Switchgrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand lovegrass----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5
GlsD: Grandfield-----	Loamy Sand Prairie PE 31- 44 R078CY105TX	4,800	3,800	2,800	Sand bluestem----- Little bluestem----- Indiangrass----- Switchgrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand lovegrass----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5
GmuA: Gracemont-----	Subirrigated (saline) R078XY097OK	7,000	6,000	5,000	Switchgrass----- Indiangrass----- Miscellaneous perennial forbs-- Sand bluestem----- Maximilian sunflower----- Alkali muhly----- Alkali sacaton----- Eastern baccharis----- Inland saltgrass----- Miscellaneous perennial grasses Prairie cordgrass----- Sedge----- Western wheatgrass-----	25 10 10 10 5 5 5 5 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GmwA: Gracemont-----	Subirrigated (saline) R078XY097OK	7,000	6,000	5,000	Switchgrass-----	25
					Indiangrass-----	10
					Miscellaneous perennial forbs--	10
					Sand bluestem-----	10
					Maximilian sunflower-----	5
					Alkali muhly-----	5
					Alkali sacaton-----	5
					Eastern baccharis-----	5
					Inland saltgrass-----	5
					Miscellaneous perennial grasses	5
					Prairie cordgrass-----	5
					Sedge-----	5
					Western wheatgrass-----	5
GsEA: Gracemore-----	Subirrigated (saline) R078XY097OK	6,500	5,500	4,500	Switchgrass-----	25
					Indiangrass-----	10
					Miscellaneous perennial forbs--	10
					Sand bluestem-----	10
					Maximilian sunflower-----	5
					Alkali muhly-----	5
					Alkali sacaton-----	5
					Eastern baccharis-----	5
					Inland saltgrass-----	5
					Miscellaneous perennial grasses	5
					Prairie cordgrass-----	5
					Sedge-----	5
					Western wheatgrass-----	5
Ezell-----	Meadow R078XY090OK	6,500	4,500	2,500	Sedge-----	40
					Rush-----	25
					Prairie cordgrass-----	10
					Miscellaneous perennial grasses	8
					Miscellaneous perennial forbs--	5
					Switchgrass-----	5
					Miscellaneous shrubs-----	3
					Buttonbush-----	2
					Miscellaneous trees-----	2

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HdmA: Hardeman-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	3,700	2,950	2,200	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
HdmB: Hardeman-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	3,700	2,950	2,200	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
HdmC: Hardeman-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	3,700	2,950	2,200	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
HdmE: Hardeman-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	3,500	2,700	2,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		<i>Lb/acre</i>	<i>Lb/acre</i>	<i>Lb/acre</i>		<i>Pct</i>
HeyB: Heatly-----	Deep Sand Savannah R078CY017OK	4,200	3,100	2,300	Little bluestem----- Sand bluestem----- Havard's oak----- Indiangrass----- Scribner panicum----- Miscellaneous perennial grasses Miscellaneous shrubs----- Purpletop tridens----- Sand dropseed----- Sand lovegrass----- Switchgrass-----	25 20 15 5 5 5 5 5 5 5 5
HkfA: Headrick-----	Seep Meadow R078CY089OK	6,000	5,000	4,000	Switchgrass----- Indiangrass----- Bushy bluestem----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand bluestem----- Sedge----- Buttonbush----- Muhly----- Miscellaneous trees----- Prairie bundleflower-----	20 10 10 10 10 10 10 5 5 5 5
HksA: Headrick-----	Seep Meadow R078CY089OK	6,000	5,000	4,000	Switchgrass----- Indiangrass----- Bushy bluestem----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Sand bluestem----- Sedge----- Buttonbush----- Muhly----- Miscellaneous trees----- Prairie bundleflower-----	20 10 10 10 10 10 10 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HolA: Hollister-----	Clay Loam PE 31-44 R078CY096TX	2,600	1,900	1,300	Blue grama----- Buffalograss----- Arizona cottontop----- Miscellaneous perennial grasses Sideoats grama----- Vine mesquite----- Little bluestem----- Miscellaneous perennial forbs-- Sand bluestem----- Silver bluestem----- Western wheatgrass-----	20 15 10 10 10 10 5 5 5 5 5
HrAC: Harmon-----	Very Shallow PE 25-36 R078BY091TX	1,500	1,000	500	Sideoats grama----- Little bluestem----- Sand bluestem----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Silver bluestem----- Slim tridens----- Threeawn-----	35 15 15 5 5 5 5 5 5 5
Aspermont-----	Loamy PE 25-36 R078BY079TX	3,500	2,800	2,000	Sideoats grama----- Little bluestem----- Miscellaneous perennial grasses Buffalograss----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Blue grama----- Switchgrass-----	25 15 15 10 10 10 5 5 5
JesC: Jester-----	Sand Hills PE 31-44 R078CY107TX	2,500	1,800	1,200	Sand bluestem----- Little bluestem----- Giant sandreed----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Switchgrass----- Canada wildrye----- Sand lovegrass----- Tall dropseed-----	20 15 10 10 10 10 10 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		<i>Lb/acre</i>	<i>Lb/acre</i>	<i>Lb/acre</i>		<i>Pct</i>
JesF: Jester-----	Sand Hills PE 31-44 R078CY107TX	2,500	1,800	1,200	Sand bluestem----- Little bluestem----- Giant sandreed----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Switchgrass----- Canada wildrye----- Sand lovegrass----- Tall dropseed-----	20 15 10 10 10 10 10 5 5 5
KcRG: Knoco-----	Rocky Hill PE 25-36 R078BY692TX	3,500	2,500	1,500	Little bluestem----- Sand bluestem----- Sideoats grama----- Indiangrass----- Miscellaneous shrubs----- Canada wildrye----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses	25 20 20 10 10 5 5 5
Rock outcrop.						
KoBE: Knoco-----	Very Shallow Clay PE 25- 36 R078BY092TX	1,500	1,000	600	Sideoats grama----- Buffalograss----- Miscellaneous perennial grasses Silver bluestem----- Tobosa----- Alkali sacaton----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Little bluestem----- Sand bluestem-----	40 10 10 10 10 5 5 5 3 2
Badland.						

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		<i>Lb/acre</i>	<i>Lb/acre</i>	<i>Lb/acre</i>		<i>Pct</i>
LacB: La Casa-----	Clay Loam PE 25-36 R078BY072TX	2,000	1,500	1,000	Sideoats grama----- Buffalograss----- Tobosa----- Blue grama----- Miscellaneous perennial grasses Vine mesquite----- Arizona cottontop----- Texas wintergrass----- Miscellaneous perennial forbs-- Western wheatgrass-----	20 15 15 10 10 10 5 5 5 5
LDF: Landfill.						
LnuA: Lincoln-----	Sandy Bottomland R078XY068OK	2,800	2,100	1,600	Sand bluestem----- Indiangrass----- Miscellaneous perennial grasses Switchgrass----- Annual grasses----- Little bluestem----- Miscellaneous perennial forbs-- Eastern gamagrass----- Miscellaneous trees----- Threeawn-----	25 15 15 15 10 10 10 5 5 5
LnWA: Lincoln-----	Sandy Bottomland R078XY068OK	3,000	2,300	1,800	Sand bluestem----- Indiangrass----- Miscellaneous perennial grasses Switchgrass----- Annual grasses----- Little bluestem----- Miscellaneous perennial forbs-- Eastern gamagrass----- Miscellaneous trees----- Threeawn-----	25 15 15 15 10 10 10 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		<i>Lb/acre</i>	<i>Lb/acre</i>	<i>Lb/acre</i>		<i>Pct</i>
LnWA: Westola-----	Loamy Bottomland R078CY0500K	6,000	4,000	2,000	Sand bluestem----- Indiangrass----- Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Canada wildrye----- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 10 10 10 5 5 5
M-W: Water.						
MagA: Madge-----	Loamy Prairie R078CY0560K	5,700	4,200	2,700	Little bluestem----- Indiangrass----- Sand bluestem----- Sideoats grama----- Switchgrass----- Blue grama----- Buffalograss----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Tall dropseed-----	25 15 15 10 10 5 5 5 5 5
MagB: Madge-----	Loamy Prairie R078CY0560K	5,700	4,200	2,700	Little bluestem----- Indiangrass----- Sand bluestem----- Sideoats grama----- Switchgrass----- Blue grama----- Buffalograss----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Tall dropseed-----	25 15 15 10 10 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MngA: Mangum-----	Clayey Bottomland PE 25- 36 R078BY070TX	2,500	1,700	900	Buffalograss----- Vine mesquite----- Western wheatgrass----- Miscellaneous perennial grasses Tobosa----- Canada wildrye----- Alkali sacaton----- Blue grama----- Miscellaneous perennial forbs-- Sideoats grama----- Silver bluestem----- White tridens-----	15 15 15 10 10 5 5 5 5 5 5 5
NipA: Nipsum-----	Clay Loam PE 25-36 R078BY072TX	2,200	1,700	1,200	Sideoats grama----- Buffalograss----- Tobosa----- Blue grama----- Miscellaneous perennial grasses Vine mesquite----- Arizona cottontop----- Texas wintergrass----- Miscellaneous perennial forbs-- Western wheatgrass-----	20 15 15 10 10 10 5 5 5 5
NOTCOM: Area not surveyed, access denied.						
OakA: Oakley-----	Limy Prairie R078CY057OK	4,000	3,200	2,500	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Buffalograss----- Switchgrass-----	20 20 15 10 10 10 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
OakB: Oakley-----	Limy Prairie R078CY057OK	4,000	3,200	2,500	Little bluestem----- Miscellaneous perennial grasses Sideoats grama----- Blue grama----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Buffalograss----- Switchgrass-----	20 20 15 10 10 10 5 5 5
OzkA: Ozark-----	Sandy Loam Prairie PE 31- 44 R078CY110TX	5,000	4,000	3,000	Little bluestem----- Sideoats grama----- Blue grama----- Miscellaneous perennial grasses Sand bluestem----- Indiangrass----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Sand lovegrass----- Switchgrass-----	30 15 10 10 10 5 5 5 5 5
OzsA: Ozark.						
PIT: Pits.						
RakA: Roark-----	Loamy Prairie R078CY056OK	6,000	4,500	3,000	Little bluestem----- Indiangrass----- Sand bluestem----- Sideoats grama----- Switchgrass----- Blue grama----- Buffalograss----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Tall dropseed-----	25 15 15 10 10 5 5 5 5 5
RKBG: Rock outcrop.						

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
RKBG: Brico-----	Boulder Ridge 082BY004OK	4,000	2,800	2,000	Big bluestem----- Little bluestem----- Miscellaneous perennial forbs-- Sideoats grama----- Canada wildrye----- Indiangrass----- Blue grama----- Miscellaneous perennial grasses Miscellaneous trees----- Purpletop tridens----- Switchgrass-----	25 20 10 10 5 5 5 5 5 5 5
RKO: Rock outcrop.						
RuuA: Rups-----	Saline Bottomland R078XY046OK	4,000	3,000	2,000	Alkali sacaton----- Miscellaneous perennial grasses Inland saltgrass----- Miscellaneous perennial forbs-- Switchgrass----- Tall dropseed----- Vine mesquite----- Western wheatgrass-----	55 15 5 5 5 5 5 5
RuwA: Rups-----	Saline Bottomland R078XY046OK	4,000	3,000	2,000	Alkali sacaton----- Miscellaneous perennial grasses Inland saltgrass----- Miscellaneous perennial forbs-- Switchgrass----- Tall dropseed----- Vine mesquite----- Western wheatgrass-----	55 15 5 5 5 5 5 5
SkCC2: Spikebox-----	Reseeded Sandy Land R078XY834OK	1,200	750	400	---	---
Cobb-----	Reseeded Sandy Land R078XY834OK	3,000	2,100	1,000	---	---

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
SpDB: Springer-----	Loamy Sand Prairie PE 31- 44 R078CY082TX	4,600	3,600	2,600	Sand bluestem----- Little bluestem----- Indiangrass----- Switchgrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand lovegrass----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5
Devol-----	Loamy Sand Prairie PE 31- 44 R078CY105TX	4,500	3,500	2,500	Sand bluestem----- Little bluestem----- Indiangrass----- Switchgrass----- Canada wildrye----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Miscellaneous shrubs----- Sand lovegrass----- Sideoats grama-----	25 20 10 10 5 5 5 5 5 5 5
SurA: Spur-----	Loamy Bottomland R078CY0500K	5,700	3,700	2,000	Sand bluestem----- Indiangrass----- Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Canada wildrye----- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 10 10 10 5 5 5
SuuA: Spur-----	Loamy Bottomland R078CY0500K	5,700	3,700	2,000	Sand bluestem----- Indiangrass----- Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Canada wildrye----- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 10 10 10 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
SuWA: Spur-----	Loamy Bottomland PE 25-36 R078BY080TX	4,500	3,200	2,000	Sand bluestem----- Indiangrass----- Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Canada wildrye----- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 10 10 10 5 5 5
TARD: Talpa-----	Very Shallow PE 25-36 R078BY091TX	1,500	1,000	500	Sideoats grama----- Little bluestem----- Sand bluestem----- Buffalograss----- Hairy grama----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Silver bluestem----- Slim tridens----- Threeawn-----	35 15 15 5 5 5 5 5 5 5
Aspermont-----	Loamy PE 25-36 R078BY079TX	3,500	2,800	2,000	Sideoats grama----- Little bluestem----- Miscellaneous perennial grasses Buffalograss----- Miscellaneous perennial forbs-- Sand bluestem----- Indiangrass----- Blue grama----- Switchgrass-----	25 15 15 10 10 10 5 5 5
Rock outcrop.						

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
TilA: Tillman-----	Clay Loam PE 31-44 R078CY096TX	2,500	1,800	1,200	Blue grama----- Buffalograss----- Arizona cottontop----- Miscellaneous perennial grasses Sideoats grama----- Vine mesquite----- Little bluestem----- Miscellaneous perennial forbs-- Sand bluestem----- Silver bluestem----- Western wheatgrass-----	20 15 10 10 10 10 5 5 5 5 5
TilB: Tillman-----	Clay Loam PE 31-44 R078CY096TX	2,500	1,800	1,200	Blue grama----- Buffalograss----- Arizona cottontop----- Miscellaneous perennial grasses Sideoats grama----- Vine mesquite----- Little bluestem----- Miscellaneous perennial forbs-- Sand bluestem----- Silver bluestem----- Western wheatgrass-----	20 15 10 10 10 10 5 5 5 5 5
TipA: Tipton-----	Loamy Prairie R078CY056OK	6,000	4,500	3,000	Little bluestem----- Indiangrass----- Sand bluestem----- Sideoats grama----- Switchgrass----- Blue grama----- Buffalograss----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Tall dropseed-----	25 15 15 10 10 5 5 5 5 5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
TlvB: Tilvern-----	Clay Prairie PE 25-36 R078BY090TX	2,000	1,500	1,000	Sideoats grama----- Buffalograss----- Miscellaneous perennial grasses Tobosa----- Texas wintergrass----- Blue grama----- Miscellaneous perennial forbs-- Miscellaneous shrubs----- Silver bluestem----- Slim tridens----- Threeawn----- Vine mesquite-----	30 10 10 10 5 5 5 5 5 5 5 5
TpfA: Tipton-----	Loamy Prairie R078CY056OK	6,000	4,500	3,000	Little bluestem----- Indiangrass----- Sand bluestem----- Sideoats grama----- Switchgrass----- Blue grama----- Buffalograss----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Tall dropseed-----	25 15 15 10 10 5 5 5 5 5
TrwB: Treadway-----	Clay Flats R078CY064OK	1,200	800	600	Buffalograss----- Blue grama----- Miscellaneous perennial grasses Silver bluestem----- Vine mesquite----- Alkali sacaton----- Miscellaneous perennial forbs-- Sideoats grama----- Tall dropseed----- Threeawn----- Western wheatgrass-----	30 10 10 10 10 5 5 5 5 5 5
UST: Ustorthents.						

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
VeKE: Vernon-----	Clay Prairie PE 25-36 R078BY090TX	1,800	1,300	800	Sideoats grama-----	30
					Buffalograss-----	10
					Miscellaneous perennial grasses	10
					Tobosa-----	10
					Texas wintergrass-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous shrubs-----	5
					Silver bluestem-----	5
					Slim tridens-----	5
					Threeawn-----	5
Knoco-----	Very Shallow Clay PE 25-36 R078BY092TX	1,500	1,000	600	Vine mesquite-----	5
					Sideoats grama-----	40
					Buffalograss-----	10
					Miscellaneous perennial grasses	10
					Silver bluestem-----	10
					Tobosa-----	10
					Alkali sacaton-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous shrubs-----	5
					Little bluestem-----	3
					Sand bluestem-----	2
VerC: Vernon-----	Clay Prairie PE 25-36 R078BY090TX	1,800	1,300	800	Sideoats grama-----	30
					Buffalograss-----	10
					Miscellaneous perennial grasses	10
					Tobosa-----	10
					Texas wintergrass-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous shrubs-----	5
					Silver bluestem-----	5
					Slim tridens-----	5
					Threeawn-----	5
					Vine mesquite-----	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
VeTE: Vernon-----	Clay Prairie PE 25-36 R078BY090TX	1,800	1,300	800	Sideoats grama-----	30
					Buffalograss-----	10
					Miscellaneous perennial grasses	10
					Tobosa-----	10
					Texas wintergrass-----	5
					Blue grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous shrubs-----	5
					Silver bluestem-----	5
					Slim tridens-----	5
					Threeawn-----	5
					Vine mesquite-----	5
Talpa-----	Very Shallow PE 25-36 R078BY091TX	1,500	1,000	500	Sideoats grama-----	35
					Little bluestem-----	15
					Sand bluestem-----	15
					Buffalograss-----	5
					Hairy grama-----	5
					Miscellaneous perennial forbs--	5
					Miscellaneous perennial grasses	5
					Silver bluestem-----	5
					Slim tridens-----	5
					Threeawn-----	5
W: Water.						
WodB: Woods-----	Limy Prairie R078CY057OK	3,800	3,000	2,300	Little bluestem-----	20
					Miscellaneous perennial grasses	20
					Sideoats grama-----	15
					Blue grama-----	10
					Miscellaneous perennial forbs--	10
					Sand bluestem-----	10
					Indiangrass-----	5
					Buffalograss-----	5
					Switchgrass-----	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Composition
		Favorable year	Normal year	Unfavorable year		
		<i>Lb/acre</i>	<i>Lb/acre</i>	<i>Lb/acre</i>		<i>Pct</i>
WslA: Westola-----	Loamy Bottomland R078CY0500K	6,000	4,000	2,000	Sand bluestem----- Indiangrass----- Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Canada wildrye----- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 10 10 10 5 5 5
WstA: Westola-----	Loamy Bottomland R078CY0500K	6,000	4,000	2,000	Sand bluestem----- Indiangrass----- Switchgrass----- Little bluestem----- Miscellaneous perennial forbs-- Miscellaneous perennial grasses Canada wildrye----- Eastern gamagrass----- Miscellaneous trees-----	25 15 15 10 10 10 5 5 5
WtlA: Westill-----	Clay Loam PE 25-36 R078BY072TX	1,800	1,300	1,000	Sideoats grama----- Buffalograss----- Tobosa----- Blue grama----- Miscellaneous perennial grasses Vine mesquite----- Arizona cottontop----- Texas wintergrass----- Miscellaneous perennial forbs-- Western wheatgrass-----	20 15 15 10 10 10 5 5 5 5
WtlB: Westill-----	Clay Loam PE 25-36 R078BY072TX	1,800	1,300	1,000	Sideoats grama----- Buffalograss----- Tobosa----- Blue grama----- Miscellaneous perennial grasses Vine mesquite----- Arizona cottontop----- Texas wintergrass----- Miscellaneous perennial forbs-- Western wheatgrass-----	20 15 15 10 10 10 5 5 5 5

Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height on the soil.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
AcmA: Acme-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
ArHF: Arnett-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
ArnB: Arnett-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
ArnC: Arnett-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
AsmB: Aspermont-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
AsmC: Aspermont-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
BekA: Beckman.					
BfdB: Burford-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
BfdC: Burford-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
CobB: Cobb-----	Chickasaw plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Bur oak, common hackberry, lacebark elm, osageorange, ponderosa pine, green ash, black locust	---	---
CVRD: Cottonwood. Vinson-----	Chickasaw plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Bur oak, common hackberry, lacebark elm, osageorange, ponderosa pine, green ash, black locust	---	---
Rock outcrop. DAM: Dam.					
DcbB: Decobb-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
DeSD: Devol-----	Chickasaw plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine	---
Springer-----	Chickasaw plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine	---
EatA: Eastall.					
EdsB: Eda-----	Chickasaw plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust	---
EdsD: Eda-----	Chickasaw plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
EdsF: Eda-----	Chickasaw plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust	---
FayB: Farry-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
FraB: Frankirk-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
GdfB: Grandfield-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
GfGB: Grandmore-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
Grandfield-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
GlGB: Grandmore-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
Grandfield-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
GlsB: Grandfield-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
GlsD: Grandfield-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
GmuA: Gracemont.					
GmwA: Gracemont.					
GsEA: Gracemore.					
Ezell.					
HdmA: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
HdmB: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
HdmC: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
HdmE: Hardeman-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
HeyB: Heatly-----	Chickasaw plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Hkfa: Headrick-----	---	Lespedeza	Eastern redbud, oriental arborvitae, American plum, lacebark elm, osageorange, bur oak	Green ash, red mulberry, baldcypress	American sycamore, eastern cottonwood
HksA: Headrick-----	---	Lespedeza	Eastern redbud, oriental arborvitae, American plum, lacebark elm, osageorange, bur oak	Green ash, red mulberry, baldcypress	American sycamore, eastern cottonwood
Hola: Hollister-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
HrAC: Harmon.					
Aspermont-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
JesC: Jester-----	Chickasaw plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust	---
JesF: Jester-----	Chickasaw plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust	---
KcRG: Knoco. Rock outcrop.					
KoBE: Knoco. Badland.					
LacB: La Casa-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
LDF: Landfill.					
LnuA: Lincoln-----	Chickasaw plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust	---
LnWA: Lincoln-----	Chickasaw plum	---	Rocky Mountain juniper, bur oak, oriental arborvitae, ponderosa pine, Austrian pine, osageorange, common hackberry, green ash, lacebark elm, loblolly pine	Black locust	---
Westola-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
M-W: Water.					

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
MagA: Madge-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
MagB: Madge-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
MngA: Mangum-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
NipA: Nipsum-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
NOTCOM: Area not surveyed, access denied.					

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
OakA: Oakley-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
OakB: Oakley-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
OzkA: Ozark-----	---	Common lilac, lespedeza, Amur honeysuckle, American plum	Eastern redbud, Rocky Mountain juniper, oriental arborvitae, Austrian pine, bur oak	Osageorange, red mulberry, common hackberry, green ash, lacebark elm, black locust	---
OzsA: Ozark.					
PIT: Pits.					
RakA: Roark-----	---	American plum, Amur honeysuckle, common lilac, eastern redbud, oriental arborvitae	Ponderosa pine, bur oak, red mulberry, osageorange, common hackberry, lacebark elm, loblolly pine	Black locust	---
RKBG: Rock outcrop.					
Brico-----	Chickasaw plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
RKO: Rock outcrop.					
RuuA: Rups.					
RuwA: Rups.					
SkCC2: Spikebox.					
Cobb-----	Chickasaw plum	Eastern redbud, oriental arborvitae, Rocky Mountain juniper	Bur oak, common hackberry, lacebark elm, osageorange, ponderosa pine, green ash, black locust	---	---
SpDB: Springer-----	Chickasaw plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine	---
Devol-----	Chickasaw plum	Eastern redbud, oriental arborvitae	Austrian pine, Rocky Mountain juniper, bur oak, common hackberry, green ash, ponderosa pine, lacebark elm, osageorange	Black locust, loblolly pine	---
SurA: Spur-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
SuuA: Spur-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
SuWA: Spur-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
TARD: Talpa. Aspermont-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
Rock outcrop. TilA: Tillman-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
TilB: Tillman-----	American plum	Common lilac, Amur honeysuckle, eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
TipA: Tipton-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
TlvB: Tilvern-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
TpfA: Tipton-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
TrwB: Treadway.					
UST: Ustorthents.					

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
VeKE: Vernon.					
Knoco.					
VerC: Vernon.					
VeTE: Vernon.					
Talpa.					
W: Water.					
WodB: Woods-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, ponderosa pine, osageorange, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
WslA: Westola-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---
WstA: Westola-----	Shrub lespedeza	Amur honeysuckle, American plum	Eastern redbud, Scotch pine, Rocky Mountain juniper, oriental arborvitae, red mulberry, Austrian pine, ponderosa pine	Osageorange, bur oak, common hackberry, green ash, lacebark elm, black locust	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Wt1A: Westill-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---
Wt1B: Westill-----	American plum, Amur honeysuckle, common lilac	Eastern redbud, oriental arborvitae	Bur oak, osageorange, ponderosa pine, red mulberry, black locust, common hackberry, lacebark elm	Loblolly pine	---

Soil Survey of Jackson County, Oklahoma

Recreation, Part 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Not limited		Not limited		Not limited	
ArHF: Arnett-----	45	Not limited		Not limited		Somewhat limited Slope	0.88
Hardeman-----	40	Not limited		Not limited		Very limited Slope	1.00
ArnB: Arnett-----	85	Not limited		Not limited		Somewhat limited Gravel content	0.22
ArnC: Arnett-----	80	Not limited		Not limited		Somewhat limited Slope	0.50
AsmB: Aspermont-----	76	Not limited		Not limited		Not limited	
AsmC: Aspermont-----	81	Not limited		Not limited		Somewhat limited Slope	0.50
BekA: Beckman-----	81	Very limited Flooding Too clayey Restricted permeability Salinity	1.00 0.50 0.45 0.01	Somewhat limited Too clayey Restricted permeability Salinity	0.50 0.45 0.01	Somewhat limited Flooding Too clayey Restricted permeability Salinity	0.60 0.50 0.45 0.01
BfdB: Burford-----	90	Not limited		Not limited		Not limited	
BfdC: Burford-----	92	Not limited		Not limited		Somewhat limited Slope	0.50
CobB: Cobb-----	75	Not limited		Not limited		Somewhat limited Depth to bedrock Slope	0.16 0.03
CVRD: Cottonwood-----	42	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.50

Soil Survey of Jackson County, Oklahoma

Recreation, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CVRD: Vinson-----	25	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41	Somewhat limited Depth to bedrock Restricted permeability Slope	0.65 0.41 0.12
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Not limited		Not limited		Not limited	
DeSD: Devol-----	60	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88	Somewhat limited Slope Too sandy	0.97 0.88
Springer-----	27	Somewhat limited Too sandy	0.36	Somewhat limited Too sandy	0.36	Somewhat limited Slope Too sandy	0.88 0.36
EatA: Eastall-----	94	Very limited Depth to saturated zone Ponding Too clayey Restricted permeability	1.00 1.00 0.50 0.45	Very limited Depth to saturated zone Ponding Too clayey Restricted permeability	1.00 1.00 0.50 0.45	Very limited Depth to saturated zone Ponding Too clayey Restricted permeability	1.00 1.00 0.50 0.45
EdsB: Eda-----	82	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy	1.00
EdsD: Eda-----	82	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.88
EdsF: Eda-----	85	Very limited Too sandy Slope	1.00 0.63	Very limited Too sandy Slope	1.00 0.63	Very limited Slope Too sandy	1.00 1.00
FayB: Farry-----	85	Not limited		Not limited		Not limited	
FraB: Frankirk-----	80	Not limited		Not limited		Not limited	
GdfB: Grandfield-----	80	Not limited		Not limited		Not limited	

Soil Survey of Jackson County, Oklahoma

Recreation, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GfGB:							
Grandmore-----	61	Not limited		Not limited		Not limited	
Grandfield-----	32	Not limited		Not limited		Not limited	
GlGB:							
Grandmore-----	65	Somewhat limited Too sandy	0.81	Somewhat limited Too sandy	0.81	Somewhat limited Too sandy	0.81
Grandfield-----	25	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79
GlsB:							
Grandfield-----	84	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79
GlsD:							
Grandfield-----	82	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Somewhat limited Slope Too sandy	0.88 0.79
GmuA:							
Gracemont-----	90	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Salinity Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Salinity Flooding	1.00 1.00 1.00 0.60
GmwA:							
Gracemont-----	87	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Salinity Depth to saturated zone Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00
GsEA:							
Gracemore-----	80	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Salinity Depth to saturated zone Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00
Ezell-----	15	Very limited Depth to saturated zone Flooding Ponding Salinity	1.00 1.00 1.00 0.01	Very limited Depth to saturated zone Ponding Flooding Salinity	1.00 1.00 0.40 0.01	Very limited Depth to saturated zone Flooding Ponding Salinity	1.00 1.00 1.00 0.01
HdmA:							
Hardeman-----	88	Not limited		Not limited		Not limited	
HdmB:							
Hardeman-----	88	Not limited		Not limited		Not limited	
HdmC:							
Hardeman-----	90	Not limited		Not limited		Somewhat limited Slope	0.50

Soil Survey of Jackson County, Oklahoma

Recreation, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HdmE: Hardeman-----	90	Not limited		Not limited		Very limited Slope	1.00
HeyB: Heatly-----	72	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy	1.00
HkfA: Headrick-----	76	Not limited		Not limited		Not limited	
HksA: Headrick-----	83	Somewhat limited Too sandy	0.81	Somewhat limited Too sandy	0.81	Somewhat limited Too sandy	0.81
HolA: Hollister-----	91	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
HrAC: Harmon-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Gravel content Slope	1.00 1.00 0.28
Aspermont-----	44	Not limited		Not limited		Not limited	
JesC: Jester-----	87	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12
JesF: Jester-----	96	Very limited Too sandy Slope	1.00 0.63	Very limited Too sandy Slope	1.00 0.63	Very limited Too sandy Slope	1.00 1.00
KcRG: Knoco-----	45	Very limited Slope Too stony Too clayey Restricted permeability	1.00 0.76 0.50 0.45	Very limited Slope Too stony Too clayey Restricted permeability	1.00 0.76 0.50 0.45	Very limited Slope Too stony Too clayey Restricted permeability Content of large stones	1.00 0.76 0.50 0.45 0.16
Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Somewhat limited Too clayey Restricted permeability	0.50 0.45	Somewhat limited Too clayey Restricted permeability	0.50 0.45	Somewhat limited Too clayey Restricted permeability	0.50 0.45
Badland-----	30	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Recreation, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LacB: La Casa-----	79	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Very limited Flooding Too sandy	1.00 0.91	Somewhat limited Too sandy	0.91	Somewhat limited Too sandy Flooding	0.91 0.60
LnWA: Lincoln-----	65	Very limited Flooding Too sandy	1.00 0.91	Somewhat limited Too sandy Flooding	0.91 0.40	Very limited Flooding Too sandy	1.00 0.91
Westola-----	25	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
M-W: Water-----	100	Not rated		Not rated		Not rated	
MagA: Madge-----	88	Not limited		Not limited		Not limited	
MagB: Madge-----	90	Not limited		Not limited		Not limited	
MngA: Mangum-----	80	Very limited Flooding Restricted permeability	1.00 0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Flooding Restricted permeability	0.60 0.45
NipA: Nipsum-----	85	Somewhat limited Restricted permeability	0.44	Somewhat limited Restricted permeability	0.44	Somewhat limited Restricted permeability	0.44
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	
OakA: Oakley-----	80	Not limited		Not limited		Not limited	
OakB: Oakley-----	85	Not limited		Not limited		Not limited	
OzkA: Ozark-----	80	Not limited		Not limited		Not limited	
OzsA: Ozark-----	90	Very limited Salinity	1.00	Very limited Salinity	1.00	Very limited Salinity	1.00
PIT: Pits-----	100	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Recreation, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RakA: Roark-----	81	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Brico-----	30	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope Content of large stones Gravel content	1.00 0.92 0.42
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	
RuuA: Rups-----	90	Very limited Flooding Salinity	1.00 0.50	Somewhat limited Salinity	0.50	Somewhat limited Flooding Salinity	0.60 0.50
RuWA: Rups-----	82	Very limited Flooding Salinity	1.00 0.50	Somewhat limited Salinity Flooding	0.50 0.40	Very limited Flooding Salinity	1.00 0.50
SkCC2: Spikebox-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.50
Cobb-----	45	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.50 0.01
SpDB: Springer-----	70	Somewhat limited Too sandy	0.36	Somewhat limited Too sandy	0.36	Somewhat limited Too sandy	0.36
Devol-----	22	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88
SurA: Spur-----	70	Very limited Flooding	1.00	Not limited		Not limited	
SuuA: Spur-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
SuWA: Spur-----	85	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
TARD: Talpa-----	46	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.28

Soil Survey of Jackson County, Oklahoma

Recreation, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TARD: Aspermont-----	37	Not limited		Not limited		Somewhat limited Slope	0.03
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41
TilB: Tillman-----	84	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.41
TipA: Tipton-----	73	Not limited		Not limited		Not limited	
TlvB: Tilvern-----	78	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
TpfA: Tipton-----	90	Not limited		Not limited		Not limited	
TrwB: Treadway-----	87	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Restricted permeability	0.50 0.45
Knoco-----	35	Somewhat limited Too clayey Restricted permeability	0.50 0.45	Somewhat limited Too clayey Restricted permeability	0.50 0.45	Very limited Slope Too clayey Restricted permeability	1.00 0.50 0.45
VerC: Vernon-----	64	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Restricted permeability	0.50 0.45
VeTE: Vernon-----	46	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Restricted permeability	0.88 0.45

Soil Survey of Jackson County, Oklahoma

Recreation, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VeTE: Talpa-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.88
W: Water-----	100	Not rated		Not rated		Not rated	
WodB: Woods-----	95	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
WslA: Westola-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
WstA: Westola-----	92	Very limited Flooding	1.00	Not limited		Not limited	
WtlA: Westill-----	85	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
WtlB: Westill-----	83	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45

Soil Survey of Jackson County, Oklahoma

Recreation, Part 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Not limited		Not limited		Not limited	
ArHF: Arnett-----	45	Not limited		Not limited		Not limited	
Hardeman-----	40	Not limited		Not limited		Not limited	
ArnB: Arnett-----	85	Not limited		Not limited		Not limited	
ArnC: Arnett-----	80	Not limited		Not limited		Not limited	
AsmB: Aspermont-----	76	Not limited		Not limited		Not limited	
AsmC: Aspermont-----	81	Not limited		Not limited		Not limited	
BekA: Beckman-----	81	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50	Very limited Too clayey Flooding Salinity	1.00 0.60 0.01
BfdB: Burford-----	90	Not limited		Not limited		Not limited	
BfdC: Burford-----	92	Not limited		Not limited		Not limited	
CobB: Cobb-----	75	Not limited		Not limited		Somewhat limited Depth to bedrock	0.16
CVRD: Cottonwood-----	42	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
Vinson-----	25	Not limited		Not limited		Somewhat limited Depth to bedrock	0.65
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Not limited		Not limited		Not limited	

Soil Survey of Jackson County, Oklahoma

Recreation, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DeSD: Devol-----	60	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88	Not limited	
Springer-----	27	Somewhat limited Too sandy	0.36	Somewhat limited Too sandy	0.36	Not limited	
EatA: Eastall-----	94	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00
EdsB: Eda-----	82	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy	0.84 0.50
EdsD: Eda-----	82	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy	0.86 0.50
EdsF: Eda-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty Slope Too sandy	0.91 0.63 0.50
FayB: Farry-----	85	Not limited		Not limited		Not limited	
FraB: Frankirk-----	80	Not limited		Not limited		Not limited	
GdfB: Grandfield-----	80	Not limited		Not limited		Not limited	
GfGB: Grandmore-----	61	Not limited		Not limited		Not limited	
Grandfield-----	32	Not limited		Not limited		Not limited	
GlGB: Grandmore-----	65	Somewhat limited Too sandy	0.81	Somewhat limited Too sandy	0.81	Not limited	
Grandfield-----	25	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Not limited	
GlsB: Grandfield-----	84	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Not limited	
GlsD: Grandfield-----	82	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Not limited	

Soil Survey of Jackson County, Oklahoma

Recreation, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GmuA: Gracemont-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Salinity Depth to saturated zone Flooding	1.00 1.00 0.60
GmwA: Gracemont-----	87	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Salinity Depth to saturated zone	1.00 1.00 1.00
GsEA: Gracemore-----	80	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Salinity Depth to saturated zone Droughty	1.00 1.00 1.00 0.22
Ezell-----	15	Very limited Depth to saturated zone Ponding Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Ponding Flooding	1.00 1.00 0.40	Very limited Flooding Depth to saturated zone Ponding Droughty Salinity	1.00 1.00 1.00 0.06 0.01
HdmA: Hardeman-----	88	Not limited		Not limited		Not limited	
HdmB: Hardeman-----	88	Not limited		Not limited		Not limited	
HdmC: Hardeman-----	90	Not limited		Not limited		Not limited	
HdmE: Hardeman-----	90	Not limited		Not limited		Not limited	
HeyB: Heatly-----	72	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Too sandy Droughty	0.50 0.01
HkfA: Headrick-----	76	Not limited		Not limited		Not limited	
HksA: Headrick-----	83	Somewhat limited Too sandy	0.81	Somewhat limited Too sandy	0.81	Somewhat limited	
HolA: Hollister-----	91	Not limited		Not limited		Not limited	

Soil Survey of Jackson County, Oklahoma

Recreation, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HrAC: Harmon-----	50	Not limited		Not limited		Very limited Depth to bedrock Carbonate content Droughty	1.00 1.00 1.00
Aspermont-----	44	Not limited		Not limited		Not limited	
JesC: Jester-----	87	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty	0.99
JesF: Jester-----	96	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.99 0.63
KcRG: Knoco-----	45	Somewhat limited Too stony Slope Too clayey	0.76 0.50 0.50	Somewhat limited Too stony Too clayey	0.76 0.50	Very limited Droughty Slope Too clayey Content of large stones	1.00 1.00 1.00 0.16
Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50	Very limited Droughty Too clayey	1.00 1.00
Badland-----	30	Not rated		Not rated		Not rated	
LacB: La Casa-----	79	Not limited		Not limited		Not limited	
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Somewhat limited Too sandy	0.91	Somewhat limited Too sandy	0.91	Somewhat limited Droughty Flooding	0.98 0.60
LnWA: Lincoln-----	65	Somewhat limited Too sandy Flooding	0.91 0.40	Somewhat limited Too sandy Flooding	0.91 0.40	Very limited Flooding Droughty	1.00 0.98
Westola-----	25	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
M-W: Water-----	100	Not rated		Not rated		Not rated	
MagA: Madge-----	88	Not limited		Not limited		Not limited	

Soil Survey of Jackson County, Oklahoma

Recreation, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MagB: Madge-----	90	Not limited		Not limited		Not limited	
MngA: Mangum-----	80	Not limited		Not limited		Somewhat limited Flooding	0.60
NipA: Nipsum-----	85	Not limited		Not limited		Not limited	
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	
OakA: Oakley-----	80	Not limited		Not limited		Not limited	
OakB: Oakley-----	85	Not limited		Not limited		Not limited	
OzkA: Ozark-----	80	Not limited		Not limited		Not limited	
OzsA: Ozark-----	90	Not limited		Not limited		Very limited Salinity	1.00
PIT: Pits-----	100	Not rated		Not rated		Not rated	
RakA: Roark-----	81	Not limited		Not limited		Not limited	
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Brico-----	30	Somewhat limited Slope	0.02	Not limited		Very limited Slope Content of large stones	1.00 0.92
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	
RuuA: Rups-----	90	Not limited		Not limited		Somewhat limited Flooding Salinity	0.60 0.50
RuwA: Rups-----	82	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Very limited Flooding Salinity	1.00 0.50
SkCC2: Spikebox-----	50	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00

Soil Survey of Jackson County, Oklahoma

Recreation, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SkCC2: Cobb-----	45	Not limited		Not limited		Somewhat limited Depth to bedrock	0.01
SpDB: Springer-----	70	Somewhat limited Too sandy	0.36	Somewhat limited Too sandy	0.36	Not limited	
Devol-----	22	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy	0.88	Not limited	
SurA: Spur-----	70	Not limited		Not limited		Not limited	
SuuA: Spur-----	90	Not limited		Not limited		Somewhat limited Flooding	0.60
SuWA: Spur-----	85	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
TARD: Talpa-----	46	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
Aspermont-----	37	Not limited		Not limited		Not limited	
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Not limited		Not limited		Not limited	
TilB: Tillman-----	84	Not limited		Not limited		Not limited	
TipA: Tipton-----	73	Not limited		Not limited		Not limited	
TlvB: Tilvern-----	78	Not limited		Not limited		Not limited	
TpfA: Tipton-----	90	Not limited		Not limited		Not limited	
TrwB: Treadway-----	87	Not limited		Not limited		Not limited	
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Not limited		Not limited		Somewhat limited Droughty	0.01
Knoco-----	35	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50	Very limited Droughty Too clayey	1.00 1.00

Soil Survey of Jackson County, Oklahoma

Recreation, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VerC: Vernon-----	64	Not limited		Not limited		Not limited	
VeTE: Vernon-----	46	Not limited		Not limited		Not limited	
Talpa-----	25	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WodB: Woods-----	95	Not limited		Not limited		Not limited	
WslA: Westola-----	90	Not limited		Not limited		Somewhat limited Flooding	0.60
WstA: Westola-----	92	Not limited		Not limited		Not limited	
WtlA: Westill-----	85	Not limited		Not limited		Not limited	
WtlB: Westill-----	83	Not limited		Not limited		Not limited	

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AcmaA: Acme-----	79	Somewhat limited Restricted permeability Depth to saturated zone	0.46 0.43	Somewhat limited Seepage	0.53
ArHF: Arnett-----	45	Somewhat limited Restricted permeability	0.46	Very limited Seepage Slope	1.00 0.68
Hardeman-----	40	Not limited		Very limited Seepage Slope	1.00 1.00
ArnB: Arnett-----	85	Somewhat limited Restricted permeability	0.46	Very limited Seepage	1.00
ArnC: Arnett-----	80	Somewhat limited Restricted permeability	0.46	Very limited Seepage Slope	1.00 0.32
AsmB: Aspermont-----	76	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.28
AsmC: Aspermont-----	81	Very limited Restricted permeability	1.00	Somewhat limited Slope Seepage	0.32 0.28
BekA: Beckman-----	81	Very limited Flooding Restricted permeability Depth to saturated zone	1.00 1.00 0.84	Very limited Flooding Depth to saturated zone	1.00 0.17
BfdB: Burford-----	90	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.01

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BfdC: Burford-----	92	Very limited Restricted permeability	1.00	Somewhat limited Slope Seepage	0.32 0.01
CobB: Cobb-----	75	Very limited Depth to bedrock Restricted permeability	1.00 0.46	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.02
CVRD: Cottonwood-----	42	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00 0.32
Vinson-----	25	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 0.53 0.08
Rock outcrop-----	23	Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated	
DcbB: Decobb-----	87	Somewhat limited Restricted permeability Depth to bedrock	0.46 0.14	Very limited Seepage	1.00
DeSD: Devol-----	60	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.82
Springer-----	27	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
EatA: Eastall-----	94	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
EdsB: Eda-----	82	Very limited Filtering capacity	1.00	Very limited Seepage	1.00

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
EdsD: Eda-----	82	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
EdsF: Eda-----	85	Very limited Filtering capacity Slope	1.00 0.63	Very limited Slope Seepage	1.00 1.00
FayB: Farry-----	85	Very limited Filtering capacity Restricted permeability	1.00 0.46	Very limited Seepage	1.00
FraB: Frankirk-----	80	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.53
GdfB: Grandfield-----	80	Somewhat limited Restricted permeability	0.46	Very limited Seepage	1.00
GfGB: Grandmore-----	61	Very limited Restricted permeability Depth to saturated zone	1.00 0.97	Somewhat limited Seepage Depth to saturated zone	0.53 0.52
Grandfield-----	32	Somewhat limited Restricted permeability	0.46	Very limited Seepage	1.00
GlGB: Grandmore-----	65	Very limited Restricted permeability Depth to saturated zone	1.00 0.97	Somewhat limited Seepage Depth to saturated zone	0.53 0.52
Grandfield-----	25	Somewhat limited Restricted permeability	0.46	Very limited Seepage	1.00
GlsB: Grandfield-----	84	Somewhat limited Restricted permeability	0.46	Very limited Seepage	1.00
GlsD: Grandfield-----	82	Somewhat limited Restricted permeability	0.46	Very limited Seepage Slope	1.00 0.68

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GmuA: Gracemont-----	90	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
GmwA: Gracemont-----	87	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
GsEA: Gracemore-----	80	Very limited Flooding Depth to saturated zone Filtering capacity	1.00 1.00 1.00	Very limited Flooding Seepage Depth to saturated zone	1.00 1.00 1.00
Ezell-----	15	Very limited Flooding Depth to saturated zone Filtering capacity Ponding	1.00 1.00 1.00 1.00	Very limited Flooding Seepage Depth to saturated zone Ponding	1.00 1.00 1.00 1.00
HdmA: Hardeman-----	88	Not limited		Very limited Seepage	1.00
HdmB: Hardeman-----	88	Not limited		Very limited Seepage	1.00
HdmC: Hardeman-----	90	Not limited		Very limited Seepage Slope	1.00 0.32
HdmE: Hardeman-----	90	Not limited		Very limited Seepage Slope	1.00 1.00
HeyB: Heatly-----	72	Somewhat limited Restricted permeability	0.46	Very limited Seepage	1.00
HkfA: Headrick-----	76	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.53

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
HksA: Headrick-----	83	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.53
HolA: Hollister-----	91	Very limited Restricted permeability	1.00	Not limited	
HrAC: Harmon-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 0.53 0.18
Aspermont-----	44	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.28
JesC: Jester-----	87	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00
JesF: Jester-----	96	Very limited Filtering capacity Slope	1.00 0.63	Very limited Seepage Slope	1.00 1.00
KcRG: Knoco-----	45	Very limited Restricted permeability Slope	1.00 1.00	Very limited Slope	1.00
Rock outcrop-----	20	Not rated		Not rated	
KoBE: Knoco-----	45	Very limited Restricted permeability	1.00	Not limited	
Badland-----	30	Not rated		Not rated	
LacB: La Casa-----	79	Very limited Restricted permeability	1.00	Not limited	
LDF: Landfill-----	100	Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
LnuA: Lincoln-----	90	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
LnWA: Lincoln-----	65	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
Westola-----	25	Very limited Flooding	1.00	Very limited Flooding Seepage	1.00 1.00
M-W: Water-----	100	Not rated		Not rated	
MagA: Madge-----	88	Somewhat limited Restricted permeability	0.46	Very limited Seepage	1.00
MagB: Madge-----	90	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
MngA: Mangum-----	80	Very limited Flooding Restricted permeability	1.00 1.00	Very limited Flooding	1.00
NipA: Nipsum-----	85	Very limited Restricted permeability	1.00	Not limited	
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated	
OakA: Oakley-----	80	Very limited Restricted permeability Depth to saturated zone	1.00 0.01	Somewhat limited Seepage	0.53
OakB: Oakley-----	85	Very limited Restricted permeability Depth to saturated zone	1.00 0.01	Somewhat limited Seepage	0.53

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
OzkA: Ozark-----	80	Very limited Restricted permeability Depth to saturated zone	1.00 0.97	Somewhat limited Depth to saturated zone Seepage	0.52 0.01
OzsA: Ozark-----	90	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.53
PIT: Pits-----	100	Not rated		Not rated	
RakA: Roark-----	81	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.01
RKBG: Rock outcrop-----	60	Not rated		Not rated	
Brico-----	30	Very limited Restricted permeability Slope Content of large stones	1.00 1.00 0.37	Very limited Slope Content of large stones	1.00 0.90
RKO: Rock outcrop-----	100	Not rated		Not rated	
RuuA: Rups-----	90	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
RuwA: Rups-----	82	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
SkCC2: Spikebox-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.32

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SkCC2: Cobb-----	45	Very limited Depth to bedrock Restricted permeability	1.00 0.46	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.32
SpDB: Springer-----	70	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Devol-----	22	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
SurA: Spur-----	70	Somewhat limited Restricted permeability Flooding	0.46 0.40	Somewhat limited Seepage Flooding	0.53 0.40
SuuA: Spur-----	90	Very limited Flooding Restricted permeability	1.00 0.46	Very limited Flooding Seepage	1.00 0.53
SuwA: Spur-----	85	Very limited Flooding Restricted permeability	1.00 0.46	Very limited Flooding Seepage	1.00 0.53
TARD: Talpa-----	46	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00 0.18
Aspermont-----	37	Very limited Restricted permeability	1.00	Somewhat limited Seepage Slope	0.28 0.02
Rock outcrop-----	11	Not rated		Not rated	
TilA: Tillman-----	85	Very limited Restricted permeability	1.00	Not limited	
TilB: Tillman-----	84	Very limited Restricted permeability	1.00	Not limited	

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TipA: Tipton-----	73	Somewhat limited Restricted permeability	0.46	Somewhat limited Seepage	0.53
TlvB: Tilvern-----	78	Very limited Restricted permeability	1.00	Not limited	
TpfA: Tipton-----	90	Somewhat limited Restricted permeability	0.46	Very limited Seepage	1.00
TrwB: Treadway-----	87	Very limited Restricted permeability	1.00	Not limited	
UST: Ustorthents-----	100	Not rated		Not rated	
VeKE: Vernon-----	40	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.32
Knoco-----	35	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.92
VerC: Vernon-----	64	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.32
VeTE: Vernon-----	46	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.68
Talpa-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00 0.68
W: Water-----	100	Not rated		Not rated	
WodB: Woods-----	95	Very limited Restricted permeability	1.00	Not limited	

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WslA: Westola-----	90	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage	1.00 1.00
WstA: Westola-----	92	Somewhat limited Flooding	0.40	Very limited Seepage Flooding	1.00 0.40
WtlA: Westill-----	85	Very limited Restricted permeability	1.00	Not limited	
WtlB: Westill-----	83	Very limited Restricted permeability	1.00	Not limited	

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
ArHF: Arnett-----	45	Very limited Seepage	1.00	Not limited		Not limited	
Hardeman-----	40	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
ArnB: Arnett-----	85	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.22
ArnC: Arnett-----	80	Very limited Too sandy Seepage	1.00 1.00	Very limited Seepage	1.00	Somewhat limited Too sandy Seepage	0.50 0.22
AsmB: Aspermont-----	76	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
AsmC: Aspermont-----	81	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
BekA: Beckman-----	81	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Too clayey Hard to compact	1.00 1.00
BfdB: Burford-----	90	Very limited Too clayey	1.00	Not limited		Somewhat limited Too clayey	0.50
BfdC: Burford-----	92	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
CobB: Cobb-----	75	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00
CVRD: Cottonwood-----	42	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CVRD: Vinson-----	25	Very limited Depth to bedrock Too clayey	1.00 0.50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey	1.00 0.50
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Very limited Depth to bedrock Seepage	1.00 1.00	Not limited		Not limited	
DeSD: Devol-----	60	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.88
Springer-----	27	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
EataA: Eastall-----	94	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00
EdsB: Eda-----	82	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
EdsD: Eda-----	82	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Seepage Too sandy	1.00 0.50
EdsF: Eda-----	85	Very limited Seepage Too sandy Slope	1.00 1.00 0.63	Very limited Seepage Slope	1.00 0.63	Very limited Too sandy Seepage Slope	1.00 1.00 0.63
FayB: Farry-----	85	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Seepage	1.00
FraB: Frankirk-----	80	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
GdfB: Grandfield-----	80	Very limited Seepage	1.00	Not limited		Somewhat limited Seepage	0.52

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GfGB: Grandmore-----	61	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact	1.00
Grandfield-----	32	Very limited Seepage	1.00	Not limited		Not limited	
GlGB: Grandmore-----	65	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Hard to compact	1.00
Grandfield-----	25	Very limited Seepage	1.00	Not limited		Not limited	
GlsB: Grandfield-----	84	Very limited Seepage	1.00	Not limited		Somewhat limited Seepage	0.52
GlsD: Grandfield-----	82	Very limited Seepage	1.00	Not limited		Not limited	
GmuA: Gracemont-----	90	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.22
GmwA: Gracemont-----	87	Very limited Flooding Depth to saturated zone Too sandy Seepage	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Seepage	1.00 0.50 0.22
GsEA: Gracemore-----	80	Very limited Flooding Depth to saturated zone Seepage Too sandy	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Seepage	1.00 1.00 1.00
GsEA: Ezell-----	15	Very limited Flooding Depth to saturated zone Seepage Too sandy Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Seepage Ponding	1.00 1.00 1.00 1.00

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HdmA: Hardeman-----	88	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
HdmB: Hardeman-----	88	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
HdmC: Hardeman-----	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
HdmE: Hardeman-----	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
HeyB: Heatly-----	72	Very limited Seepage	1.00	Very limited Seepage	1.00	Not limited	
HkfA: Headrick-----	76	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.47
HksA: Headrick-----	83	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey Depth to saturated zone	1.00 0.50 0.47
HolA: Hollister-----	91	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
HrAC: Harmon-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Carbonate content	1.00 1.00
Aspermont-----	44	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
JesC: Jester-----	87	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
JesF: Jester-----	96	Very limited Seepage Too sandy Slope	1.00 1.00 0.63	Very limited Seepage Slope	1.00 0.63	Very limited Too sandy Seepage Slope	1.00 1.00 0.63
KcRG: Knoco-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KcRG: Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Not limited		Not limited		Not limited	
Badland-----	30	Not rated		Not rated		Not rated	
LacB: La Casa-----	79	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Very limited Flooding Seepage Too sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too sandy Seepage	1.00 1.00
LnWA: Lincoln-----	65	Very limited Flooding Seepage Too sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too sandy Seepage	1.00 1.00
Westola-----	25	Very limited Flooding Seepage	1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Somewhat limited Seepage	0.52
M-W: Water-----	100	Not rated		Not rated		Not rated	
MagA: Madge-----	88	Very limited Seepage Too clayey	1.00 0.50	Not limited		Somewhat limited Too clayey	0.50
MagB: Madge-----	90	Very limited Seepage	1.00	Not limited		Not limited	
MngA: Mangum-----	80	Very limited Flooding Too clayey	1.00 0.50	Very limited Flooding	1.00	Somewhat limited Too clayey	0.50
NipA: Nipsum-----	85	Somewhat limited Too clayey	0.50	Not limited		Very limited Too clayey	1.00
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OakA: Oakley-----	80	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
OakB: Oakley-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
OzkA: Ozark-----	80	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
OzsA: Ozark-----	90	Somewhat limited Too clayey Depth to saturated zone	0.50 1.00	Somewhat limited Depth to saturated zone	0.47	Somewhat limited Too clayey Depth to saturated zone	0.50 0.11
PIT: Pits-----	100	Not rated		Not rated		Not rated	
RakA: Roark-----	81	Very limited Seepage	1.00	Not limited		Somewhat limited Too clayey	0.50
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Brico-----	30	Very limited Slope Content of large stones Too clayey	1.00 0.51 0.50	Very limited Slope	1.00	Very limited Slope Content of large stones Too clayey	1.00 0.51 0.50
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	
RuuA: Rups-----	90	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.47
RuwA: Rups-----	82	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.47

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SkCC2: Spikebox-----	50	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.22
Cobb-----	45	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00
SpDB: Springer-----	70	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.52
Devol-----	22	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Seepage Too sandy	1.00 0.50
SurA: Spur-----	70	Somewhat limited Too clayey Flooding	0.50 0.40	Somewhat limited Flooding	0.40	Somewhat limited Too clayey	0.50
SuuA: Spur-----	90	Very limited Flooding Too clayey	1.00 0.50	Very limited Flooding	1.00	Somewhat limited Too clayey	0.50
SuwA: Spur-----	85	Very limited Flooding Too clayey	1.00 0.50	Very limited Flooding	1.00	Somewhat limited Too clayey	0.50
TARD: Talpa-----	46	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Aspermont-----	37	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
TilB: Tillman-----	84	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
TipA: Tipton-----	73	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
TlvB: Tilvern-----	78	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00

Soil Survey of Jackson County, Oklahoma

Sanitary Facilities, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TpfA: Tipton-----	90	Very limited Seepage Too clayey	1.00 0.50	Not limited		Somewhat limited Too clayey	0.50
TrwB: Treadway-----	87	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
Knoco-----	35	Not limited		Not limited		Not limited	
VerC: Vernon-----	64	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
VeTE: Vernon-----	46	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
Talpa-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WodB: Woods-----	95	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
WslA: Westola-----	90	Very limited Flooding Seepage	1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Somewhat limited Seepage	0.52
WstA: Westola-----	92	Very limited Seepage Flooding	1.00 0.40	Very limited Seepage Flooding	1.00 0.40	Somewhat limited Seepage	0.52
WtlA: Westill-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
WtlB: Westill-----	83	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Not limited		Somewhat limited Depth to saturated zone	0.16	Not limited	
ArHF: Arnett-----	45	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell Slope	0.22 0.12
Hardeman-----	40	Not limited		Not limited		Very limited Slope	1.00
ArnB: Arnett-----	85	Somewhat limited Shrink-swell	0.22	Not limited		Somewhat limited Shrink-swell	0.22
ArnC: Arnett-----	80	Not limited		Not limited		Not limited	
AsmB: Aspermont-----	76	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.22
AsmC: Aspermont-----	81	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.22
BekA: Beckman-----	81	Very limited Flooding Shrink-swell	1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.35	Very limited Flooding Shrink-swell	1.00 1.00
BfdB: Burford-----	90	Somewhat limited Shrink-swell	0.50	Not limited		Somewhat limited Shrink-swell	0.50
BfdC: Burford-----	92	Very limited Shrink-swell	1.00	Not limited		Very limited Shrink-swell	1.00
CobB: Cobb-----	75	Not limited		Somewhat limited Depth to soft bedrock	0.15	Not limited	
CVRD: Cottonwood-----	42	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CVRD: Vinson-----	25	Somewhat limited Depth to hard bedrock Shrink-swell	0.64 0.50	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Somewhat limited Depth to hard bedrock Shrink-swell	0.64 0.50
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Not limited		Not limited		Not limited	
DeSD: Devol-----	60	Not limited		Not limited		Somewhat limited Slope	0.28
Springer-----	27	Not limited		Not limited		Somewhat limited Slope	0.12
EatA: Eastall-----	94	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
EdsB: Eda-----	82	Not limited		Not limited		Not limited	
EdsD: Eda-----	82	Not limited		Not limited		Somewhat limited Slope	0.12
EdsF: Eda-----	85	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
FayB: Farry-----	85	Not limited		Not limited		Not limited	
FraB: Frankirk-----	80	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
GdfB: Grandfield-----	80	Not limited		Not limited		Not limited	
GfGB: Grandmore-----	61	Not limited		Somewhat limited Depth to saturated zone Shrink-swell	0.53 0.50	Not limited	
Grandfield-----	32	Not limited		Not limited		Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
G1GB: Grandmore-----	65	Not limited		Somewhat limited Depth to saturated zone Shrink-swell	0.53 0.50	Not limited	
Grandfield-----	25	Not limited		Not limited		Not limited	
G1sB: Grandfield-----	84	Not limited		Not limited		Not limited	
G1sD: Grandfield-----	82	Not limited		Not limited		Somewhat limited Slope	0.12
GmuA: Gracemont-----	90	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
GmwA: Gracemont-----	87	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
GsEA: Gracemore-----	80	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Ezell-----	15	Very limited Flooding Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Ponding	1.00 1.00 1.00
HdmA: Hardeman-----	88	Not limited		Not limited		Not limited	
HdmB: Hardeman-----	88	Not limited		Not limited		Not limited	
HdmC: Hardeman-----	90	Not limited		Not limited		Not limited	
HdmE: Hardeman-----	90	Not limited		Not limited		Very limited Slope	1.00
HeyB: Heatly-----	72	Not limited		Not limited		Not limited	
HkfA: Headrick-----	76	Not limited		Very limited Depth to saturated zone	1.00	Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HksA: Headrick-----	83	Not limited		Very limited Depth to saturated zone Shrink-swell	1.00 0.50	Not limited	
HolA: Hollister-----	91	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
HrAC: Harmon-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Aspermont-----	44	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.22
JesC: Jester-----	87	Not limited		Not limited		Not limited	
JesF: Jester-----	96	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
KcRG: Knoco-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Not limited		Not limited		Not limited	
Badland-----	30	Not rated		Not rated		Not rated	
LacB: La Casa-----	79	Somewhat limited Shrink-swell	0.94	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.94
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
LnWA: Lincoln-----	65	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Westola-----	25	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
M-W: Water-----	100	Not rated		Not rated		Not rated	
MagA: Madge-----	88	Not limited		Not limited		Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MagB: Madge-----	90	Not limited		Not limited		Not limited	
MngA: Mangum-----	80	Very limited Flooding Shrink-swell	1.00 0.94	Very limited Flooding Shrink-swell	1.00 0.94	Very limited Flooding Shrink-swell	1.00 0.94
NipA: Nipsum-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	
OakA: Oakley-----	80	Not limited		Somewhat limited Depth to saturated zone	0.01	Not limited	
OakB: Oakley-----	85	Not limited		Somewhat limited Depth to saturated zone	0.01	Not limited	
OzkA: Ozark-----	80	Not limited		Somewhat limited Depth to saturated zone	0.53	Not limited	
OzsA: Ozark-----	90	Not limited		Somewhat limited Depth to saturated zone	0.95	Not limited	
PIT: Pits-----	100	Not rated		Not rated		Not rated	
RakA: Roark-----	81	Somewhat limited Shrink-swell	0.78	Not limited		Somewhat limited Shrink-swell	0.78
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Brico-----	30	Very limited Slope Shrink-swell Content of large stones	1.00 0.50 0.37	Very limited Slope Shrink-swell Content of large stones	1.00 0.50 0.37	Very limited Slope Shrink-swell Content of large stones	1.00 0.50 0.37
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RuuA: Rups-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
RuwA: Rups-----	82	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
SkCC2: Spikebox-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Cobb-----	45	Not limited		Somewhat limited Depth to soft bedrock	0.01	Not limited	
SpDB: Springer-----	70	Not limited		Not limited		Not limited	
Devol-----	22	Not limited		Not limited		Not limited	
SurA: Spur-----	70	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
SuuA: Spur-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
SuWA: Spur-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
TARD: Talpa-----	46	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
Aspermont-----	37	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
TilB: Tillman-----	84	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
TipA: Tipton-----	73	Not limited		Not limited		Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TlvB: Tilvern-----	78	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
TpfA: Tipton-----	90	Not limited		Not limited		Not limited	
TrwB: Treadway-----	87	Somewhat limited Shrink-swell	0.94	Somewhat limited Shrink-swell	0.94	Somewhat limited Shrink-swell	0.94
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Very limited Shrink-swell	1.00	Not limited		Very limited Shrink-swell	1.00
Knoco-----	35	Not limited		Not limited		Somewhat limited Slope	0.50
VerC: Vernon-----	64	Very limited Shrink-swell	1.00	Not limited		Very limited Shrink-swell	1.00
VeTE: Vernon-----	46	Very limited Shrink-swell	1.00	Not limited		Very limited Shrink-swell Slope	1.00 0.12
Talpa-----	25	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00 0.12
W: Water-----	100	Not rated		Not rated		Not rated	
WodB: Woods-----	95	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
WslA: Westola-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
WstA: Westola-----	92	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
WtlA: Westill-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
WtlB: Westill-----	83	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Very limited Low strength	1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.16 0.10	Not limited	
ArHF: Arnett-----	45	Somewhat limited Low strength Shrink-swell	0.78 0.22	Very limited Cutbanks cave	1.00	Not limited	
Hardeman-----	40	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
ArnB: Arnett-----	85	Somewhat limited Low strength Shrink-swell	0.78 0.22	Somewhat limited Cutbanks cave	0.10	Not limited	
ArnC: Arnett-----	80	Not limited		Very limited Cutbanks cave	1.00	Not limited	
AsmB: Aspermont-----	76	Very limited Low strength Shrink-swell	1.00 0.22	Somewhat limited Depth to dense layer Cutbanks cave Too clayey	0.50 0.10 0.02	Not limited	
AsmC: Aspermont-----	81	Very limited Low strength Shrink-swell	1.00 0.22	Somewhat limited Depth to dense layer Cutbanks cave Too clayey	0.50 0.10 0.02	Not limited	
BekA: Beckman-----	81	Very limited Flooding Low strength Shrink-swell	1.00 1.00 1.00	Somewhat limited Flooding Too clayey Depth to saturated zone Cutbanks cave	0.60 0.50 0.35 0.10	Very limited Too clayey Flooding Salinity	1.00 0.60 0.01
BfdB: Burford-----	90	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Depth to dense layer Cutbanks cave Too clayey	0.50 0.10 0.02	Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BfdC: Burford-----	92	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Depth to dense layer Cutbanks cave Too clayey	0.50 0.10 0.02	Not limited	
CobB: Cobb-----	75	Not limited		Somewhat limited Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.15 0.10	Somewhat limited Depth to bedrock	0.16
CVRD: Cottonwood-----	42	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Vinson-----	25	Very limited Low strength Depth to hard bedrock Shrink-swell	1.00 0.64 0.50	Very limited Depth to hard bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Somewhat limited Depth to bedrock	0.65
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
DeSD: Devol-----	60	Not limited		Very limited Cutbanks cave	1.00	Not limited	
Springer-----	27	Not limited		Very limited Cutbanks cave	1.00	Not limited	
EatA: Eastall-----	94	Very limited Depth to saturated zone Low strength Shrink-swell Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 1.00 0.32	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00
EdsB: Eda-----	82	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty Too sandy	0.84 0.50

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EdsD: Eda-----	82	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty Too sandy	0.86 0.50
EdsF: Eda-----	85	Somewhat limited Slope	0.63	Very limited Cutbanks cave Slope	1.00 0.63	Somewhat limited Droughty Slope Too sandy	0.91 0.63 0.50
FayB: Farry-----	85	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
FraB: Frankirk-----	80	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
GdfB: Grandfield-----	80	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GfGB: Grandmore-----	61	Not limited		Somewhat limited Depth to saturated zone Cutbanks cave	0.53 0.10	Not limited	
Grandfield-----	32	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GlGB: Grandmore-----	65	Not limited		Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.53 0.10 0.01	Not limited	
Grandfield-----	25	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GlsB: Grandfield-----	84	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GlsD: Grandfield-----	82	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GmuA: Gracemont-----	90	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Salinity Depth to saturated zone Flooding	1.00 1.00 0.60

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GmwA: Gracemont-----	87	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 0.80	Very limited Flooding Salinity Depth to saturated zone	1.00 1.00 1.00 1.00
GsEA: Gracemore-----	80	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 0.80	Very limited Flooding Salinity Depth to saturated zone Droughty	1.00 1.00 1.00 0.22
Ezell-----	15	Very limited Depth to saturated zone Flooding Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Flooding	1.00 1.00 1.00 0.80	Very limited Flooding Depth to saturated zone Ponding Droughty Salinity	1.00 1.00 1.00 0.06 0.01
HdmA: Hardeman-----	88	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
HdmB: Hardeman-----	88	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
HdmC: Hardeman-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
HdmE: Hardeman-----	90	Not limited		Very limited Cutbanks cave	1.00	Not limited	
HeyB: Heatly-----	72	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Too sandy Droughty	0.50 0.01
HkfA: Headrick-----	76	Not limited		Very limited Depth to saturated zone Cutbanks cave Too clayey	1.00 0.10 0.01	Not limited	
HksA: Headrick-----	83	Not limited		Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HolA: Hollister-----	91	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Too clayey	1.00 0.03	Not limited	
HrAC: Harmon-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Carbonate content Droughty	1.00 1.00 1.00
Aspermont-----	44	Very limited Low strength Shrink-swell	1.00 0.22	Somewhat limited Depth to dense layer Cutbanks cave Too clayey	0.50 0.10 0.02	Not limited	
JesC: Jester-----	87	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.99
JesF: Jester-----	96	Somewhat limited Slope	0.63	Very limited Cutbanks cave Slope	1.00 0.63	Somewhat limited Droughty Slope	0.99 0.63
KcRG: Knoco-----	45	Very limited Slope Low strength	1.00 1.00	Very limited Slope Too clayey Depth to dense layer Cutbanks cave	1.00 0.50 0.50 0.10	Very limited Droughty Slope Too clayey Content of large stones	1.00 1.00 1.00 0.16
Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Very limited Low strength	1.00	Somewhat limited Too clayey Depth to dense layer Cutbanks cave	0.50 0.50 0.10	Very limited Droughty Too clayey	1.00 1.00
Badland-----	30	Not rated		Not rated		Not rated	
LacB: La Casa-----	79	Very limited Low strength Shrink-swell	1.00 0.94	Somewhat limited Cutbanks cave Too clayey	0.10 0.02	Not limited	
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Droughty Flooding	0.95 0.60

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LnWA: Lincoln-----	65	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Very limited Flooding Droughty	1.00 0.98
Westola-----	25	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.80	Very limited Flooding	1.00
M-W: Water-----	100	Not rated		Not rated		Not rated	
MagA: Madge-----	88	Somewhat limited Low strength	0.78	Somewhat limited Cutbanks cave	0.10	Not limited	
MagB: Madge-----	90	Somewhat limited Low strength	0.78	Somewhat limited Cutbanks cave	0.10	Not limited	
MngA: Mangum-----	80	Very limited Flooding Low strength Shrink-swell	1.00 1.00 0.94	Somewhat limited Flooding Too clayey Cutbanks cave	0.60 0.50 0.10	Somewhat limited Flooding	0.60
NipA: Nipsum-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	
OakA: Oakley-----	80	Not limited		Somewhat limited Cutbanks cave Depth to saturated zone	0.10 0.01	Not limited	
OakB: Oakley-----	85	Not limited		Somewhat limited Cutbanks cave Depth to saturated zone	0.10 0.01	Not limited	
OzkA: Ozark-----	80	Not limited		Somewhat limited Depth to saturated zone Cutbanks cave	0.53 0.10	Not limited	
OzsA: Ozark-----	90	Not limited		Somewhat limited Depth to saturated zone Cutbanks cave	0.95 0.10	Very limited Salinity	1.00

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PIT: Pits-----	100	Not rated		Not rated		Not rated	
RakA: Roark-----	81	Very limited Low strength Shrink-swell	1.00 0.78	Somewhat limited Cutbanks cave	0.10	Not limited	
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Brico-----	30	Very limited Slope Shrink-swell Content of large stones	1.00 0.50 0.37	Very limited Slope Content of large stones Too clayey Cutbanks cave	1.00 0.37 0.12 0.10	Very limited Slope Content of large stones	1.00 0.92
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	
RuuA: Rups-----	90	Very limited Flooding Low strength Shrink-swell	1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Somewhat limited Flooding Salinity	0.60 0.50
RuWA: Rups-----	82	Very limited Flooding Low strength Shrink-swell	1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.80 0.10	Very limited Flooding Salinity	1.00 0.50
SkCC2: Spikebox-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Cobb-----	45	Not limited		Somewhat limited Depth to dense layer Cutbanks cave Depth to soft bedrock	0.50 0.10 0.01	Somewhat limited Depth to bedrock	0.01
SpDB: Springer-----	70	Not limited		Very limited Cutbanks cave	1.00	Not limited	
Devol-----	22	Not limited		Very limited Cutbanks cave	1.00	Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SurA: Spur-----	70	Very limited Low strength Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
SuuA: Spur-----	90	Very limited Flooding Low strength	1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
SuwA: Spur-----	85	Very limited Flooding Low strength	1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
TARD: Talpa-----	46	Very limited Depth to hard bedrock Low strength	1.00 0.22	Very limited Depth to hard bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Aspermont-----	37	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Depth to dense layer Cutbanks cave Too clayey	0.50 0.10 0.02	Not limited	
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Very limited Shrink-swell Low strength	1.00 1.00	Somewhat limited Cutbanks cave Too clayey	0.10 0.03	Not limited	
TilB: Tillman-----	84	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Cutbanks cave Too clayey	0.10 0.03	Not limited	
TipA: Tipton-----	73	Somewhat limited Low strength	0.78	Somewhat limited Cutbanks cave	0.10	Not limited	
TlvB: Tilvern-----	78	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Too clayey Depth to dense layer Cutbanks cave	0.50 0.50 0.10	Not limited	
TpfA: Tipton-----	90	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
TrwB: Treadway-----	87	Very limited Low strength Shrink-swell	1.00 0.94	Somewhat limited Cutbanks cave	0.10	Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Too clayey Depth to dense layer Cutbanks cave	0.50 0.50 0.10	Somewhat limited Droughty	0.01
Knoco-----	35	Very limited Low strength	1.00	Somewhat limited Too clayey Depth to dense layer Cutbanks cave	0.50 0.50 0.10	Very limited Droughty Too clayey	1.00 1.00
VerC: Vernon-----	64	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Too clayey Depth to dense layer Cutbanks cave	0.50 0.50 0.10	Not limited	
VeTE: Vernon-----	46	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Too clayey Depth to dense layer Cutbanks cave	0.50 0.50 0.10	Not limited	
Talpa-----	25	Very limited Depth to hard bedrock Low strength	1.00 0.22	Very limited Depth to hard bedrock Depth to dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WodB: Woods-----	95	Very limited Low strength Shrink-swell	1.00 1.00	Very limited Cutbanks cave Too clayey	1.00 0.12	Not limited	
WslA: Westola-----	90	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Flooding	0.60
WstA: Westola-----	92	Somewhat limited Flooding	0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
WtlA: Westill-----	85	Very limited Shrink-swell Low strength	1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Not limited	

Soil Survey of Jackson County, Oklahoma

Building Site Development, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WtlB: Westill-----	83	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Too clayey	0.50		
		Low strength	1.00	Cutbanks cave	0.10		

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
AcmA:					
Acme-----	79	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ArHF:					
Arnett-----	45	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02
Hardeman-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ArnB:					
Arnett-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
ArnC:					
Arnett-----	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AsmB:					
Aspermont-----	76	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AsmC:					
Aspermont-----	81	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BekA:					
Beckman-----	81	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BfdB:					
Burford-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BfdC:					
Burford-----	92	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
CobB:					
Cobb-----	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CVRD:					
Cottonwood-----	42	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Vinson-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop-----	23	Not rated		Not rated	
DAM:					
Dam-----	100	Not rated		Not rated	
DcbB:					
Decobb-----	87	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
DeSD:					
Devol-----	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.10
Springer-----	27	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.10
EatA:					
Eastall-----	94	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EdsB:					
Eda-----	82	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.69
EdsD:					
Eda-----	82	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.69
EdsF:					
Eda-----	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.26
		Thickest layer	0.00	Thickest layer	0.26
FayB:					
Farry-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.02

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
FraB: Frankirk-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GdfB: Grandfield-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GfGB: Grandmore-----	61	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Grandfield-----	32	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GlGB: Grandmore-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Grandfield-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GlsB: Grandfield-----	84	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GlsD: Grandfield-----	82	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GmuA: Gracemont-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.03
GmwA: Gracemont-----	87	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.01 0.10
GsEA: Gracemore-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.42
Ezell-----	15	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
HdmA: Hardeman-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
HdmB: Hardeman-----	88	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HdmC: Hardeman-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HdmE: Hardeman-----	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
HeyB: Heatly-----	72	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.03
		Thickest layer	0.00	Thickest layer	0.37
Hkfa: Headrick-----	76	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HksA: Headrick-----	83	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HolA: Hollister-----	91	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HrAC: Harmon-----	50	Not rated		Not rated	
		Bottom layer	0.00	Bottom layer	0.00
Aspermont-----	44	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JesC: Jester-----	87	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.28
		Thickest layer	0.00	Bottom layer	0.72
JesF: Jester-----	96	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.28
		Thickest layer	0.00	Thickest layer	0.28
KcRG: Knoco-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rock outcrop-----	20	Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
KoBE:					
Knoco-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Badland-----	30	Not rated		Not rated	
LacB:					
La Casa-----	79	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LDF:					
Landfill-----	100	Not rated		Not rated	
LnuA:					
Lincoln-----	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.25
LnWA:					
Lincoln-----	65	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.08
Westola-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
M-W:					
Water-----	100	Not rated		Not rated	
MagA:					
Madge-----	88	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MagB:					
Madge-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MngA:					
Mangum-----	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NipA:					
Nipsum-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NOTCOM:					
Area not surveyed, access denied-----	100	Not rated		Not rated	
OakA:					
Oakley-----	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
OakB:					
Oakley-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
OzkA:					
Ozark-----	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
OzsA:					
Ozark-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PIT:					
Pits-----	100	Not rated		Not rated	
RakA:					
Roark-----	81	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RKBG:					
Rock outcrop-----	60	Not rated		Not rated	
Brico-----	30	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
RKO:					
Rock outcrop-----	100	Not rated		Not rated	
RuuA:					
Rups-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RuWA:					
Rups-----	82	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SkCC2:					
Spikebox-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cobb-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SpDB:					
Springer-----	70	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Devol-----	22	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.11
		Thickest layer	0.00	Bottom layer	0.14

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
SurA: Spur-----	70	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
SuuA: Spur-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
SuwA: Spur-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TARD: Talpa-----	46	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Aspermont-----	37	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Rock outcrop-----	11	Not rated		Not rated	
TilA: Tillman-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TilB: Tillman-----	84	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TipA: Tipton-----	73	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TlvB: Tilvern-----	78	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TpfA: Tipton-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.04
TrwB: Treadway-----	87	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
UST: Ustorthents-----	100	Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
VeKE: Vernon-----	40	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Knoco-----	35	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
VerC: Vernon-----	64	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
VeTE: Vernon-----	46	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Talpa-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
W: Water-----	100	Not rated		Not rated	
WodB: Woods-----	95	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
WslA: Westola-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.00 0.06
WstA: Westola-----	92	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
WtlA: Westill-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
WtlB: Westill-----	83	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Fair Low content of organic matter Sodium content Water erosion	0.12 0.90 0.99	Fair Low strength	0.22	Poor Salinity Hard to reclaim Sodium content	0.00 0.00 0.60
ArHF: Arnett-----	45	Fair Low content of organic matter	0.32	Fair Low strength	0.22	Fair Hard to reclaim	0.92
Hardeman-----	40	Fair Low content of organic matter	0.18	Good		Good	
ArnB: Arnett-----	85	Fair Low content of organic matter	0.02	Good		Fair Rock fragments	0.88
ArnC: Arnett-----	80	Fair Low content of organic matter	0.02	Good		Poor Rock fragments Hard to reclaim	0.00 0.92
AsmB: Aspermont-----	76	Fair Low content of organic matter Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.95	Fair Hard to reclaim	0.86
AsmC: Aspermont-----	81	Fair Low content of organic matter Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.96	Fair Hard to reclaim	0.90
BekA: Beckman-----	81	Poor Too clayey Low content of organic matter Salinity Sodium content Water erosion	0.00 0.50 0.88 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.12	Poor Too clayey Salinity Sodium content	0.00 0.00 0.98

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BfdB: Burford-----	90	Fair Low content of organic matter Too clayey Water erosion	0.05 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.91	Fair Too clayey Hard to reclaim	0.53 0.54
BfdC: Burford-----	92	Fair Low content of organic matter Too clayey Water erosion	0.05 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.92	Fair Too clayey	0.53
CobB: Cobb-----	75	Fair Low content of organic matter Depth to bedrock Droughty	0.50 0.84 0.86	Poor Depth to bedrock	0.00	Fair Hard to reclaim Depth to bedrock	0.46 0.84
CVRD: Cottonwood-----	42	Poor Droughty Depth to bedrock Low content of organic matter Water erosion	0.00 0.00 0.88 0.99	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.00
Vinson-----	25	Fair Droughty Depth to bedrock Water erosion	0.35 0.35 0.99	Poor Depth to bedrock Low strength	0.00 0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.35
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Fair Low content of organic matter	0.18	Good		Poor Hard to reclaim	0.00
DeSD: Devol-----	60	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.24 0.78	Good		Fair Too sandy	0.78
Springer-----	27	Poor Wind erosion Low content of organic matter Too acid	0.00 0.18 0.92	Good		Good	

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EatA: Eastall-----	94	Poor Too clayey Low content of organic matter Water erosion	0.00 0.60 0.99	Poor Depth to saturated zone Low strength Shrink-swell	0.00 0.00 0.00	Poor Too clayey Depth to saturated zone	0.00 0.00 0.00
EdsB: Eda-----	82	Poor Wind erosion Low content of organic matter Too sandy Droughty	0.00 0.12 0.26 0.94	Good		Fair Too sandy	0.26
EdsD: Eda-----	82	Poor Wind erosion Low content of organic matter Too sandy Droughty	0.00 0.12 0.26 0.93	Good		Fair Too sandy	0.26
EdsF: Eda-----	85	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.90	Good		Poor Too sandy Slope	0.00 0.37
FayB: Farry-----	85	Fair Low content of organic matter	0.88	Good		Good	
FraB: Frankirk-----	80	Fair Too clayey Low content of organic matter Water erosion	0.02 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.94	Fair Too clayey	0.01
GdfB: Grandfield-----	80	Fair Low content of organic matter	0.50	Good		Good	
GfGB: Grandmore-----	61	Fair Low content of organic matter	0.18	Poor Low strength	0.00	Good	
Grandfield-----	32	Fair Low content of organic matter	0.50	Good		Good	

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
G1GB: Grandmore-----	65	Poor Wind erosion Low content of organic matter	0.00 0.18	Poor Low strength	0.00	Good	
Grandfield-----	25	Poor Wind erosion Low content of organic matter	0.00 0.50	Good		Good	
GlsB: Grandfield-----	84	Poor Wind erosion Low content of organic matter	0.00 0.50	Good		Good	
GlsD: Grandfield-----	82	Poor Wind erosion Low content of organic matter	0.00 0.50	Good		Good	
GmuA: Gracemont-----	90	Fair Low content of organic matter Salinity	0.12 0.88	Poor Depth to saturated zone	0.00	Poor Salinity Depth to saturated zone	0.00 0.00
GmwA: Gracemont-----	87	Fair Low content of organic matter Salinity	0.12 0.88	Poor Depth to saturated zone	0.00	Poor Salinity Depth to saturated zone	0.00 0.00
GsEA: Gracemore-----	80	Poor Too sandy Low content of organic matter Salinity Droughty	0.00 0.12 0.88 0.91	Poor Depth to saturated zone	0.00	Poor Too sandy Salinity Depth to saturated zone	0.00 0.00 0.00
Ezell-----	15	Fair Too sandy Low content of organic matter Carbonate content	0.86 0.88 0.92	Poor Depth to saturated zone	0.00	Poor Depth to saturated zone Too sandy	0.00 0.86
HdmA: Hardeman-----	88	Fair Low content of organic matter	0.18	Good		Good	
HdmB: Hardeman-----	88	Fair Low content of organic matter	0.18	Good		Good	

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HdmC: Hardeman-----	90	Fair Low content of organic matter	0.18	Good		Good	
HdmE: Hardeman-----	90	Fair Low content of organic matter	0.18	Good		Good	
HeyB: Heatly-----	72	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.60	Good		Poor Too sandy	0.00
HkfA: Headrick-----	76	Fair Low content of organic matter	0.88	Fair Depth to saturated zone	0.89	Fair Depth to saturated zone	0.89
HksA: Headrick-----	83	Poor Wind erosion Low content of organic matter	0.00 0.50	Poor Low strength Depth to saturated zone Shrink-swell	0.00 0.89 0.99	Fair Depth to saturated zone	0.89
HolA: Hollister-----	91	Poor Too clayey Low content of organic matter Water erosion	0.00 0.50 0.90	Poor Low strength Shrink-swell	0.00 0.12	Poor Too clayey Hard to reclaim	0.00 0.05
HrAC: Harmon-----	50	Poor Droughty Carbonate content Depth to bedrock Low content of organic matter	0.00 0.00 0.00 0.18	Poor Depth to bedrock	0.00	Poor Carbonate content Hard to reclaim Rock fragments Depth to bedrock	0.00 0.00 0.00 0.00
Aspermont-----	44	Fair Low content of organic matter Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.96	Good	
JesC: Jester-----	87	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.32	Good		Poor Too sandy	0.00

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JesF: Jester-----	96	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.33	Good		Poor Too sandy Slope	0.00 0.37
KcRG: Knoco-----	45	Poor Too clayey Droughty Low content of organic matter	0.00 0.00 0.05	Poor Low strength Slope	0.00 0.50	Poor Too clayey Hard to reclaim Slope	0.00 0.00 0.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Poor Too clayey Droughty Low content of organic matter	0.00 0.00 0.05	Poor Low strength	0.00	Poor Too clayey Hard to reclaim	0.00 0.00
Badland-----	30	Not rated		Not rated		Not rated	
LacB: La Casa-----	79	Poor Too clayey Low content of organic matter Carbonate content Water erosion	0.00 0.18 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.83	Poor Hard to reclaim Too clayey	0.00 0.00
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.42	Good		Poor Too sandy	0.00
LnWA: Lincoln-----	65	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.36	Good		Poor Too sandy	0.00
Westola-----	25	Fair Low content of organic matter	0.12	Good		Good	
M-W: Water-----	100	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MagA: Madge-----	88	Fair Low content of organic matter Water erosion	0.88 0.99	Fair Low strength	0.22	Good	
MagB: Madge-----	90	Fair Low content of organic matter Water erosion	0.50 0.99	Fair Low strength	0.22	Good	
MngA: Mangum-----	80	Poor Too clayey Low content of organic matter Water erosion	0.00 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.52	Poor Too clayey	0.00
NipA: Nipsum-----	85	Poor Too clayey	0.00	Poor Low strength Shrink-swell	0.00 0.87	Poor Too clayey	0.00
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	
OakA: Oakley-----	80	Poor Too alkaline Low content of organic matter Carbonate content Water erosion	0.00 0.18 0.68 0.99	Good		Fair Carbonate content	0.68
OakB: Oakley-----	85	Poor Too alkaline Low content of organic matter Carbonate content Water erosion	0.00 0.18 0.68 0.99	Good		Fair Carbonate content	0.68
OzkA: Ozark-----	80	Fair Low content of organic matter Too clayey	0.50 0.98	Good		Fair Hard to reclaim Sodium content Too clayey	0.10 0.60 0.64
OzsA: Ozark-----	90	Fair Low content of organic matter Sodium content Salinity Too clayey	0.50 0.60 0.88 0.92	Good		Fair Hard to reclaim Too clayey	0.16 0.80

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PIT: Pits-----	100	Not rated		Not rated		Not rated	
RakA: Roark-----	81	Fair Too clayey Low content of organic matter Water erosion	0.08 0.50 0.90	Fair Shrink-swell	0.92	Fair Too clayey	0.07
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Brico-----	30	Fair Too clayey Low content of organic matter Cobble content	0.08 0.12 0.49	Poor Cobble content Shrink-swell Slope	0.00 0.89 0.98	Poor Hard to reclaim Rock fragments Slope Too clayey	0.00 0.00 0.00 0.06
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	
RuuA: Rups-----	90	Poor Salinity Low content of organic matter Sodium content Too clayey	0.00 0.50 0.90 0.92	Poor Low strength Shrink-swell Depth to saturated zone	0.00 0.87 0.89	Poor Salinity Too clayey Depth to saturated zone Sodium content	0.00 0.60 0.89 0.90
RuWA: Rups-----	82	Poor Salinity Low content of organic matter Sodium content Too clayey	0.00 0.50 0.90 0.92	Poor Low strength Shrink-swell Depth to saturated zone	0.00 0.87 0.89	Poor Salinity Too clayey Depth to saturated zone Sodium content	0.00 0.60 0.00 0.90
SkCC2: Spikebox-----	50	Poor Droughty Depth to bedrock Low content of organic matter	0.00 0.00 0.50	Poor Depth to bedrock	0.00	Poor Hard to reclaim Depth to bedrock	0.00 0.00
Cobb-----	45	Fair Low content of organic matter Droughty Depth to bedrock	0.50 0.99 0.99	Poor Depth to bedrock	0.00	Fair Hard to reclaim Depth to bedrock	0.35 0.99
SpDB: Springer-----	70	Poor Wind erosion Low content of organic matter Too acid	0.00 0.18 0.92	Good		Good	

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SpDB: Devol-----	22	Poor Wind erosion Low content of organic matter Too sandy Too acid	 0.00 0.02 0.78 0.92	Good		Fair Too sandy	0.78
SurA: Spur-----	70	Fair Low content of organic matter	 0.88	Fair Low strength	0.22	Good	
SuuA: Spur-----	90	Fair Low content of organic matter Water erosion	 0.88 0.99	Poor Low strength	0.00	Good	
SuwA: Spur-----	85	Fair Low content of organic matter	 0.88	Fair Low strength	0.22	Good	
TARD: Talpa-----	46	Poor Droughty Depth to bedrock Carbonate content	 0.00 0.00 0.68	Poor Depth to bedrock Low strength	0.00 0.78	Poor Hard to reclaim Depth to bedrock Carbonate content	 0.00 0.00 0.68
Aspermont-----	37	Fair Low content of organic matter Carbonate content Water erosion	 0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.96	Fair Carbonate content	0.68
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Poor Too clayey Low content of organic matter Water erosion Sodium content	 0.00 0.18 0.90 0.90	Poor Low strength Shrink-swell	0.00 0.12	Poor Too clayey Sodium content	0.00 0.90
TilB: Tillman-----	84	Poor Too clayey Low content of organic matter Water erosion	 0.00 0.18 0.90	Poor Low strength Shrink-swell	0.00 0.12	Poor Too clayey	0.00
TipA: Tipton-----	73	Fair Low content of organic matter Water erosion	 0.50 0.99	Good		Good	

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TlvB: Tilvern-----	78	Poor Too clayey Low content of organic matter Water erosion Sodium content	0.00 0.12 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.29	Poor Too clayey Hard to reclaim Sodium content	0.00 0.61 0.98
TpfA: Tipton-----	90	Fair Water erosion	0.99	Poor Low strength	0.00	Good	
TrwB: Treadway-----	87	Fair Too clayey Low content of organic matter Water erosion	0.08 0.12 0.90	Poor Low strength Shrink-swell	0.00 0.65	Fair Too clayey	0.05
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Poor Too clayey Low content of organic matter Droughty Water erosion Sodium content	0.00 0.05 0.71 0.90 0.90	Poor Low strength Shrink-swell	0.00 0.93	Poor Too clayey Hard to reclaim Sodium content	0.00 0.20 0.90
Knoco-----	35	Poor Too clayey Droughty Low content of organic matter	0.00 0.00 0.05	Poor Low strength	0.00	Poor Too clayey Hard to reclaim	0.00 0.00
VerC: Vernon-----	64	Poor Too clayey Low content of organic matter Water erosion Sodium content	0.00 0.05 0.90 0.90	Poor Low strength Shrink-swell	0.00 0.76	Poor Too clayey Hard to reclaim Sodium content	0.00 0.20 0.90
VeTE: Vernon-----	46	Poor Too clayey Low content of organic matter Water erosion Sodium content Droughty	0.00 0.05 0.90 0.90 0.95	Poor Low strength Shrink-swell	0.00 0.69	Poor Too clayey Hard to reclaim Sodium content	0.00 0.16 0.40

Soil Survey of Jackson County, Oklahoma

Construction Materials, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VeTE: Talpa-----	25	Poor Droughty Depth to bedrock Carbonate content	 0.00 0.00 0.68	Poor Depth to bedrock Low strength	 0.00 0.78	Poor Hard to reclaim Depth to bedrock Carbonate content	 0.00 0.00 0.68
W: Water-----	100	Not rated		Not rated		Not rated	
WodB: Woods-----	95	Poor Too clayey Carbonate content Low content of organic matter Water erosion	 0.00 0.46 0.88 0.90	Poor Low strength Shrink-swell	 0.00 0.12	Poor Too clayey	 0.00
WslA: Westola-----	90	Fair Low content of organic matter	 0.12	Good		Good	
WstA: Westola-----	92	Fair Low content of organic matter	 0.12	Good		Good	
WtlA: Westill-----	85	Poor Too clayey Low content of organic matter Water erosion	 0.00 0.18 0.90	Poor Low strength Shrink-swell	 0.00 0.12	Poor Too clayey	 0.00
WtlB: Westill-----	83	Poor Too clayey Low content of organic matter Water erosion	 0.00 0.18 0.90	Poor Low strength Shrink-swell	 0.00 0.12	Poor Too clayey	 0.00

Soil Survey of Jackson County, Oklahoma

Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Very limited Seepage Seepage	1.00 0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
ArHF: Arnett-----	45	Very limited Seepage	1.00	Somewhat limited Seepage	0.02	Very limited Depth to water	1.00
Hardeman-----	40	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
ArnB: Arnett-----	85	Very limited Seepage	1.00	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
ArnC: Arnett-----	80	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
AsmB: Aspermont-----	76	Somewhat limited Seepage	0.54	Somewhat limited Piping	0.07	Very limited Depth to water	1.00
AsmC: Aspermont-----	81	Somewhat limited Seepage	0.54	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
BekA: Beckman-----	81	Not limited		Somewhat limited Hard to pack Salinity	0.62 0.12	Very limited Slow refill Depth to water Salty water Cutbanks cave	1.00 0.96 0.50 0.10
BfdB: Burford-----	90	Somewhat limited Seepage	0.12	Not limited		Very limited Depth to water	1.00
BfdC: Burford-----	92	Somewhat limited Seepage	0.12	Not limited		Very limited Depth to water	1.00
CobB: Cobb-----	75	Very limited Seepage Depth to bedrock	1.00 0.05	Somewhat limited Thin layer	0.74	Very limited Depth to water	1.00
CVRD: Cottonwood-----	42	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Piping Thin layer	1.00 1.00	Very limited Depth to water	1.00

Soil Survey of Jackson County, Oklahoma

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CVRD: Vinson-----	25	Somewhat limited Depth to bedrock Seepage	0.91 0.72	Very limited Piping Thin layer	1.00 0.91	Very limited Depth to water	1.00
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.01	Very limited Depth to water	1.00
DeSD: Devol-----	60	Very limited Seepage	1.00	Somewhat limited Seepage	0.10	Very limited Depth to water	1.00
Springer-----	27	Very limited Seepage	1.00	Somewhat limited Seepage	0.10	Very limited Depth to water	1.00
EatA: Eastall-----	94	Not limited		Very limited Depth to saturated zone Hard to pack Ponding	1.00 1.00 1.00	Very limited Slow refill Cutbanks cave	1.00 0.10
EdsB: Eda-----	82	Very limited Seepage	1.00	Somewhat limited Seepage	0.69	Very limited Depth to water	1.00
EdsD: Eda-----	82	Very limited Seepage	1.00	Somewhat limited Seepage	0.69	Very limited Depth to water	1.00
EdsF: Eda-----	85	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.26	Very limited Depth to water	1.00
FayB: Farry-----	85	Very limited Seepage	1.00	Somewhat limited Seepage	0.02	Very limited Depth to water	1.00
FraB: Frankirk-----	80	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
GdfB: Grandfield-----	80	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00

Soil Survey of Jackson County, Oklahoma

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GfGB: Grandmore-----	61	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.55	Somewhat limited Slow refill Depth to water Cutbanks cave	0.96 0.87 0.10
Grandfield-----	32	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
GlGB: Grandmore-----	65	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.68	Somewhat limited Slow refill Depth to water Cutbanks cave	0.96 0.87 0.10
Grandfield-----	25	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
GlsB: Grandfield-----	84	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
GlsD: Grandfield-----	82	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
GmuA: Gracemont-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone Salinity Seepage	1.00 0.12 0.03	Somewhat limited Salty water Cutbanks cave	0.50 0.10
GmwA: Gracemont-----	87	Very limited Seepage	1.00	Very limited Depth to saturated zone Salinity Seepage	1.00 0.12 0.10	Very limited Cutbanks cave Salty water	1.00 0.50
GsEA: Gracemore-----	80	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage Salinity	1.00 0.42 0.12	Very limited Cutbanks cave Salty water	1.00 0.50
Ezell-----	15	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Piping	1.00 1.00 0.50	Very limited Cutbanks cave	1.00
HdmA: Hardeman-----	88	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00

Soil Survey of Jackson County, Oklahoma

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HdmB: Hardeman-----	88	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
HdmC: Hardeman-----	90	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
HdmE: Hardeman-----	90	Very limited Seepage	1.00	Somewhat limited Seepage	0.05	Very limited Depth to water	1.00
HeyB: Heatly-----	72	Very limited Seepage	1.00	Somewhat limited Seepage	0.39	Very limited Depth to water	1.00
Hkfa: Headrick-----	76	Somewhat limited Seepage	0.72	Somewhat limited Depth to saturated zone Piping	0.86 0.70	Somewhat limited Slow refill Cutbanks cave Depth to water	0.28 0.10 0.06
HksA: Headrick-----	83	Somewhat limited Seepage	0.72	Somewhat limited Depth to saturated zone Piping	0.86 0.29	Somewhat limited Slow refill Cutbanks cave Depth to water	0.28 0.10 0.06
Hola: Hollister-----	91	Not limited		Somewhat limited Hard to pack	0.23	Very limited Depth to water	1.00
HrAC: Harmon-----	50	Somewhat limited Depth to bedrock	0.61	Very limited Thin layer	1.00	Very limited Depth to water	1.00
Aspermont-----	44	Somewhat limited Seepage	0.54	Somewhat limited Piping	0.09	Very limited Depth to water	1.00
JesC: Jester-----	87	Very limited Seepage	1.00	Somewhat limited Seepage	0.72	Very limited Depth to water	1.00
JesF: Jester-----	96	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.28	Very limited Depth to water	1.00
KcRG: Knoco-----	45	Somewhat limited Slope	0.12	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Not limited		Not limited		Very limited Depth to water	1.00
Badland-----	30	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LacB: La Casa-----	79	Somewhat limited Seepage	0.01	Not limited		Very limited Depth to water	1.00
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Very limited Seepage	1.00	Somewhat limited Seepage	0.25	Very limited Depth to water	1.00
LnWA: Lincoln-----	65	Very limited Seepage	1.00	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
Westola-----	25	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.01	Very limited Depth to water	1.00
M-W: Water-----	100	Not rated		Not rated		Not rated	
MagA: Madge-----	88	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00
MagB: Madge-----	90	Very limited Seepage	1.00	Somewhat limited Piping	0.83	Very limited Depth to water	1.00
MngA: Mangum-----	80	Not limited		Not limited		Very limited Depth to water	1.00
NipA: Nipsum-----	85	Somewhat limited Seepage	0.01	Not limited		Very limited Depth to water	1.00
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	
OakA: Oakley-----	80	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
OakB: Oakley-----	85	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
OzkA: Ozark-----	80	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00

Soil Survey of Jackson County, Oklahoma

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OzsA: Ozark-----	90	Somewhat limited Seepage	0.72	Very limited Piping Depth to saturated zone Salinity	1.00 0.46 0.12	Very limited Depth to water	1.00
PIT: Pits-----	100	Not rated		Not rated		Not rated	
RakA: Roark-----	81	Very limited Seepage	1.00	Somewhat limited Piping	0.43	Very limited Depth to water	1.00
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	
Brico-----	30	Somewhat limited Slope Seepage	0.04 0.04	Somewhat limited Content of large stones	0.37	Very limited Depth to water	1.00
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	
RuuA: Rups-----	90	Somewhat limited Seepage	0.04	Very limited Salinity Depth to saturated zone Piping	1.00 0.86 0.42	Very limited Salty water Slow refill Cutbanks cave Depth to water	1.00 0.96 0.10 0.06
RuwA: Rups-----	82	Somewhat limited Seepage	0.04	Very limited Salinity Depth to saturated zone Piping	1.00 0.86 0.42	Very limited Salty water Slow refill Cutbanks cave Depth to water	1.00 0.96 0.10 0.06
SkCC2: Spikebox-----	50	Somewhat limited Depth to bedrock Seepage	0.74 0.04	Very limited Thin layer	1.00	Very limited Depth to water	1.00
Cobb-----	45	Very limited Seepage Depth to bedrock	1.00 0.01	Somewhat limited Piping Thin layer	0.98 0.52	Very limited Depth to water	1.00
SpDB: Springer-----	70	Very limited Seepage	1.00	Somewhat limited Seepage	0.01	Very limited Depth to water	1.00
Devol-----	22	Very limited Seepage	1.00	Somewhat limited Seepage	0.14	Very limited Depth to water	1.00
SurA: Spur-----	70	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.87	Very limited Depth to water	1.00

Soil Survey of Jackson County, Oklahoma

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SuuA: Spur-----	90	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.72	Very limited Depth to water	1.00
SuWA: Spur-----	85	Somewhat limited Seepage	0.72	Somewhat limited Piping	0.91	Very limited Depth to water	1.00
TARD: Talpa-----	46	Very limited Depth to bedrock	1.00	Very limited Thin layer Piping	1.00 0.99	Very limited Depth to water	1.00
Aspermont-----	37	Somewhat limited Seepage	0.54	Somewhat limited Piping	0.03	Very limited Depth to water	1.00
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Not limited		Somewhat limited Piping	0.40	Very limited Depth to water	1.00
TilB: Tillman-----	84	Not limited		Somewhat limited Piping	0.40	Very limited Depth to water	1.00
TipA: Tipton-----	73	Somewhat limited Seepage	0.72	Very limited Piping	1.00	Very limited Depth to water	1.00
TlvB: Tilvern-----	78	Not limited		Somewhat limited Piping	0.22	Very limited Depth to water	1.00
TpfA: Tipton-----	90	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.04	Very limited Depth to water	1.00
TrwB: Treadway-----	87	Not limited		Somewhat limited Hard to pack	0.10	Very limited Depth to water	1.00
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Not limited		Somewhat limited Piping	0.10	Very limited Depth to water	1.00
Knoco-----	35	Not limited		Somewhat limited Piping	0.01	Very limited Depth to water	1.00
VerC: Vernon-----	64	Not limited		Somewhat limited Piping	0.60	Very limited Depth to water	1.00

Soil Survey of Jackson County, Oklahoma

Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VeTE: Vernon-----	46	Not limited		Somewhat limited Piping	0.60	Very limited Depth to water	1.00
Talpa-----	25	Very limited Depth to bedrock	1.00	Very limited Thin layer Piping	1.00 0.99	Very limited Depth to water	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WodB: Woods-----	95	Somewhat limited Seepage	0.02	Not limited		Very limited Depth to water	1.00
WslA: Westola-----	90	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.06	Very limited Depth to water	1.00
WstA: Westola-----	92	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.01	Very limited Depth to water	1.00
WtlA: Westill-----	85	Not limited		Not limited		Very limited Depth to water	1.00
WtlB: Westill-----	83	Not limited		Not limited		Very limited Depth to water	1.00

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Somewhat limited Sodium content Salinity	0.18 0.01	Somewhat limited Sodium content	0.18	Somewhat limited Sodium content	0.18
ArHF: Arnett-----	45	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.32 0.01
Hardeman-----	40	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.10 0.01
ArnB: Arnett-----	85	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
ArnC: Arnett-----	80	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
AsmB: Aspermont-----	76	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
AsmC: Aspermont-----	81	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability Too steep for surface application	1.00 0.08

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BekA: Beckman-----	81	Very limited Restricted permeability Flooding Salinity Runoff limitation Sodium content	1.00 0.60 0.50 0.40 0.08	Very limited Restricted permeability Flooding Sodium content Salinity	1.00 1.00 0.08 0.01	Very limited Restricted permeability Flooding Sodium content Salinity	1.00 0.60 0.08 0.01
BfdB: Burford-----	90	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
BfdC: Burford-----	92	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability Too steep for surface application	1.00 0.08
CobB: Cobb-----	75	Somewhat limited Depth to bedrock Droughty Filtering capacity	0.16 0.14 0.01	Very limited Low adsorption Depth to bedrock Droughty Filtering capacity	1.00 0.16 0.14 0.01	Somewhat limited Depth to bedrock Droughty Filtering capacity	0.16 0.14 0.01
CVRD: Cottonwood-----	42	Very limited Depth to bedrock Droughty Depth to dense layer	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Low adsorption	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Too steep for surface application	1.00 1.00 0.08
Vinson-----	25	Very limited Depth to dense layer Restricted permeability Droughty Depth to bedrock	1.00 1.00 0.65 0.65	Very limited Low adsorption Restricted permeability Droughty Depth to bedrock	1.00 1.00 0.65 0.65	Very limited Restricted permeability Droughty Depth to bedrock	1.00 0.65 0.65
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Somewhat limited Filtering capacity	0.01	Very limited Low adsorption Filtering capacity	1.00 0.01	Somewhat limited Filtering capacity	0.01

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DeSD: Devol-----	60	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity Too steep for surface application	1.00 0.50
Springer-----	27	Very limited Filtering capacity Too acid	1.00 0.05	Very limited Filtering capacity Too acid	1.00 0.21	Very limited Filtering capacity Too steep for surface application Too acid	1.00 0.32 0.21
EatA: Eastall-----	94	Very limited Restricted permeability Depth to saturated zone Ponding Runoff limitation	1.00 1.00 1.00 0.40	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00
EdsB: Eda-----	82	Very limited Filtering capacity Leaching limitation Droughty	1.00 0.45 0.06	Very limited Filtering capacity Droughty	1.00 0.06	Very limited Filtering capacity Droughty	1.00 0.06
EdsD: Eda-----	82	Very limited Filtering capacity Leaching limitation Droughty	1.00 0.45 0.07	Very limited Filtering capacity Droughty	1.00 0.07	Very limited Filtering capacity Too steep for surface application Droughty	1.00 0.32 0.07
EdsF: Eda-----	85	Very limited Filtering capacity Slope Leaching limitation Droughty	1.00 0.63 0.45 0.10	Very limited Filtering capacity Slope Droughty	1.00 0.63 0.10	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application Droughty	1.00 1.00 0.78 0.10
FayB: Farry-----	85	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FraB: Frankirk-----	80	Somewhat limited Restricted permeability	0.41	Somewhat limited Restricted permeability	0.31	Somewhat limited Restricted permeability	0.31
GdfB: Grandfield-----	80	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
GfGB: Grandmore-----	61	Somewhat limited Restricted permeability Filtering capacity	0.41 0.01	Somewhat limited Restricted permeability Filtering capacity	0.31 0.01	Somewhat limited Restricted permeability Filtering capacity	0.31 0.01
Grandfield-----	32	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
GlGB: Grandmore-----	65	Very limited Filtering capacity Restricted permeability	1.00 0.41	Very limited Filtering capacity Restricted permeability	1.00 0.31	Very limited Filtering capacity Restricted permeability	1.00 0.31
Grandfield-----	25	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00
GlsB: Grandfield-----	84	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00
GlsD: Grandfield-----	82	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Filtering capacity Too steep for surface application	1.00 0.32
GmuA: Gracemont-----	90	Very limited Depth to saturated zone Flooding Salinity	1.00 0.60 0.50	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Depth to saturated zone Salinity Flooding	1.00 1.00 0.60
GmwA: Gracemont-----	87	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GsEA: Gracemore-----	80	Very limited Depth to saturated zone Flooding Salinity Droughty Filtering capacity	1.00 1.00 0.50 0.09 0.01	Very limited Depth to saturated zone Flooding Salinity Droughty Filtering capacity	1.00 1.00 1.00 0.09 0.01	Very limited Depth to saturated zone Flooding Salinity Droughty Filtering capacity	1.00 1.00 1.00 0.09 0.01
Ezell-----	15	Very limited Filtering capacity Depth to saturated zone Flooding Ponding Salinity	1.00 1.00 1.00 1.00 0.01	Very limited Filtering capacity Depth to saturated zone Flooding Ponding Salinity	1.00 1.00 1.00 1.00 0.01	Very limited Filtering capacity Depth to saturated zone Flooding Ponding Salinity	1.00 1.00 1.00 1.00 0.01
HdmA: Hardeman-----	88	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
HdmB: Hardeman-----	88	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
HdmC: Hardeman-----	90	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
HdmE: Hardeman-----	90	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.10 0.01
HeyB: Heatly-----	72	Very limited Filtering capacity Leaching limitation	1.00 0.45	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hkfa: Headrick-----	76	Somewhat limited Depth to saturated zone Restricted permeability Filtering capacity	0.86 0.41 0.01	Somewhat limited Depth to saturated zone Restricted permeability Filtering capacity	0.86 0.31 0.01	Somewhat limited Depth to saturated zone Restricted permeability Filtering capacity	0.86 0.31 0.01
HksA: Headrick-----	83	Very limited Filtering capacity Depth to saturated zone Restricted permeability	1.00 0.86 0.41	Very limited Filtering capacity Depth to saturated zone Restricted permeability	1.00 0.86 0.31	Very limited Filtering capacity Depth to saturated zone Restricted permeability	1.00 0.86 0.31
Hola: Hollister-----	91	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
HrAC: Harmon-----	50	Very limited Depth to bedrock Droughty Depth to dense layer Runoff limitation	1.00 1.00 1.00 0.40	Very limited Droughty Depth to bedrock Low adsorption	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Too steep for surface application	1.00 1.00 0.02
Aspermont-----	44	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
JesC: Jester-----	87	Very limited Filtering capacity Droughty Leaching limitation	1.00 0.68 0.45	Very limited Filtering capacity Droughty	1.00 0.68	Very limited Filtering capacity Droughty	1.00 0.68
JesF: Jester-----	96	Very limited Filtering capacity Droughty Slope Leaching limitation	1.00 0.67 0.63 0.45	Very limited Filtering capacity Droughty Slope	1.00 0.67 0.63	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application Droughty	1.00 1.00 0.78 0.67

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KcRG: Knoco-----	45	Very limited Restricted permeability Droughty Depth to dense layer Shallow to densic materials Slope	1.00 1.00 1.00 1.00	Very limited Droughty Restricted permeability Shallow to densic materials Slope	1.00 1.00 1.00 1.00	Very limited Droughty Restricted permeability Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Very limited Restricted permeability Depth to dense layer Shallow to densic materials Droughty Runoff limitation	1.00 1.00 1.00 1.00 0.40	Very limited Restricted permeability Shallow to densic materials Droughty	1.00 1.00 1.00	Very limited Restricted permeability Droughty	1.00 1.00
Badland-----	30	Not rated		Not rated		Not rated	
LacB: La Casa-----	79	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Very limited Filtering capacity Flooding Droughty Leaching limitation	1.00 0.60 0.58 0.45	Very limited Filtering capacity Flooding Droughty	1.00 1.00 0.58	Very limited Filtering capacity Flooding Droughty	1.00 0.60 0.58
LnWA: Lincoln-----	65	Very limited Filtering capacity Flooding Droughty Leaching limitation	1.00 1.00 0.64 0.45	Very limited Filtering capacity Flooding Droughty	1.00 1.00 0.64	Very limited Filtering capacity Flooding Droughty	1.00 1.00 0.64
Westola-----	25	Very limited Flooding Filtering capacity	1.00 0.01	Very limited Flooding Filtering capacity	1.00 0.01	Very limited Flooding Filtering capacity	1.00 0.01

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
M-W: Water-----	100	Not rated		Not rated		Not rated	
Madge-----	88	Not limited		Not limited		Not limited	
MagB: Madge-----	90	Not limited		Not limited		Not limited	
MngA: Mangum-----	80	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff limitation	0.40				
NipA: Nipsum-----	85	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	
OakA: Oakley-----	80	Not limited		Not limited		Not limited	
OakB: Oakley-----	85	Not limited		Not limited		Not limited	
OzkA: Ozark-----	80	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01
OzsA: Ozark-----	90	Somewhat limited Salinity	0.50	Very limited Salinity	1.00	Very limited Salinity	1.00
		Sodium content	0.50	Sodium content	0.50	Sodium content	0.50
		Depth to saturated zone	0.46	Depth to saturated zone	0.46	Depth to saturated zone	0.46
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
PIT: Pits-----	100	Not rated		Not rated		Not rated	
RakA: Roark-----	81	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RKBG: Brico-----	30	Very limited Slope Cobble content Restricted permeability	1.00 0.50 0.41	Very limited Slope Cobble content Restricted permeability	1.00 0.50 0.31	Very limited Too steep for surface application Too steep for sprinkler application Cobble content Restricted permeability	1.00 1.00 0.50 0.31
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	
RuuA: Rups-----	90	Very limited Salinity Depth to saturated zone Restricted permeability Flooding Sodium content	1.00 0.86 0.85 0.60 0.18	Very limited Flooding Depth to saturated zone Restricted permeability Salinity Sodium content	1.00 0.86 0.72 0.50 0.18	Somewhat limited Depth to saturated zone Restricted permeability Flooding Salinity Sodium content	0.86 0.72 0.60 0.50 0.18
RuwA: Rups-----	82	Very limited Flooding Salinity Depth to saturated zone Restricted permeability Sodium content	1.00 1.00 0.86 0.85 0.18	Very limited Flooding Depth to saturated zone Restricted permeability Salinity Sodium content	1.00 0.86 0.72 0.50 0.18	Very limited Flooding Depth to saturated zone Restricted permeability Salinity Sodium content	1.00 0.86 0.72 0.50 0.18
SkCC2: Spikebox-----	50	Very limited Depth to bedrock Droughty Depth to dense layer Filtering capacity	1.00 1.00 1.00 0.01	Very limited Droughty Depth to bedrock Low adsorption Filtering capacity	1.00 1.00 1.00 0.01	Very limited Droughty Depth to bedrock Too steep for surface application Filtering capacity	1.00 1.00 0.08 0.01
Cobb-----	45	Somewhat limited Droughty Depth to bedrock Filtering capacity	0.01 0.01 0.01	Very limited Low adsorption Droughty Depth to bedrock Filtering capacity	1.00 0.01 0.01 0.01	Somewhat limited Too steep for surface application Droughty Depth to bedrock Filtering capacity	0.08 0.01 0.01 0.01
SpDB: Springer-----	70	Very limited Filtering capacity Too acid	1.00 0.05	Very limited Filtering capacity Too acid	1.00 0.21	Very limited Filtering capacity Too acid	1.00 0.21

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SpDB: Devol-----	22	Very limited Filtering capacity Too acid	1.00 0.05	Very limited Filtering capacity Too acid	1.00 0.21	Very limited Filtering capacity Too acid	1.00 0.21
SurA: Spur-----	70	Not limited		Somewhat limited Flooding	0.40	Not limited	
SuuA: Spur-----	90	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
SuWA: Spur-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
TARD: Talpa-----	46	Very limited Depth to bedrock Droughty Depth to dense layer Runoff limitation	1.00 1.00 1.00 0.40	Very limited Droughty Depth to bedrock Low adsorption	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Too steep for surface application	1.00 1.00 0.02
Aspermont-----	37	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Very limited Restricted permeability Runoff limitation Sodium content	1.00 0.40 0.18	Very limited Restricted permeability Sodium content	1.00 0.18	Very limited Restricted permeability Sodium content	1.00 0.18
TilB: Tillman-----	84	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
TipA: Tipton-----	73	Not limited		Not limited		Not limited	
TlvB: Tilvern-----	78	Very limited Restricted permeability Runoff limitation Sodium content	1.00 0.40 0.08	Very limited Restricted permeability Sodium content	1.00 0.08	Very limited Restricted permeability Sodium content	1.00 0.08
TpfA: Tipton-----	90	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01	Somewhat limited Filtering capacity	0.01

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TrwB: Treadway-----	87	Very limited Restricted permeability Runoff limitation Salinity	1.00 0.40 0.01	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Very limited Restricted permeability Shallow to densic materials Runoff limitation Droughty Sodium content	1.00 0.79 0.40 0.29 0.18	Very limited Restricted permeability Shallow to densic materials Droughty Sodium content	1.00 0.79 0.29 0.18	Very limited Restricted permeability Droughty Sodium content Too steep for surface application	1.00 0.29 0.18 0.08
Knoco-----	35	Very limited Restricted permeability Depth to dense layer Shallow to densic materials Droughty Runoff limitation	1.00 1.00 1.00 1.00 0.40	Very limited Restricted permeability Shallow to densic materials Droughty	1.00 1.00 1.00	Very limited Restricted permeability Droughty Too steep for surface application	1.00 1.00 0.68
VerC: Vernon-----	64	Very limited Restricted permeability Runoff limitation Sodium content Shallow to densic materials Droughty	1.00 0.40 0.18 0.10 0.01	Very limited Restricted permeability Sodium content Shallow to densic materials Droughty	1.00 0.18 0.10 0.01	Very limited Restricted permeability Sodium content Too steep for surface application Droughty	1.00 0.18 0.08 0.01
VeTE: Vernon-----	46	Very limited Restricted permeability Runoff limitation Sodium content Droughty Shallow to densic materials	1.00 0.40 0.18 0.05 0.01	Very limited Restricted permeability Sodium content Droughty Shallow to densic materials	1.00 0.18 0.05 0.01	Very limited Restricted permeability Too steep for surface application Sodium content Droughty	1.00 0.32 0.18 0.05

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 1--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VeTE: Talpa-----	25	Very limited Depth to bedrock Droughty Depth to dense layer Runoff limitation	1.00 1.00 1.00 0.40	Very limited Droughty Depth to bedrock Low adsorption	1.00 1.00 1.00	Very limited Droughty Depth to bedrock Too steep for surface application	1.00 1.00 0.32
W: Water-----	100	Not rated		Not rated		Not rated	
WodB: Woods-----	95	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
WslA: Westola-----	90	Somewhat limited Flooding Filtering capacity	0.60 0.01	Very limited Flooding Filtering capacity	1.00 0.01	Somewhat limited Flooding Filtering capacity	0.60 0.01
WstA: Westola-----	92	Somewhat limited Filtering capacity	0.01	Somewhat limited Flooding Filtering capacity	0.40 0.01	Somewhat limited Filtering capacity	0.01
WtlA: Westill-----	85	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
WtlB: Westill-----	83	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcmA: Acme-----	79	Very limited Seepage Too level Sodium content	1.00 0.50 0.18	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Somewhat limited Sodium content	0.18
ArHF: Arnett-----	45	Very limited Seepage	1.00	Very limited Restricted permeability Slope	1.00 0.12	Somewhat limited Too steep for surface application Filtering capacity	0.32 0.01
Hardeman-----	40	Very limited Seepage Too steep for surface application	1.00 0.22	Very limited Slope Restricted permeability	1.00 0.31	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.22 0.01
ArnB: Arnett-----	85	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
ArnC: Arnett-----	80	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
AsmB: Aspermont-----	76	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
AsmC: Aspermont-----	81	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability Too steep for surface application	1.00 0.08

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BekA: Beckman-----	81	Very limited Flooding Too level Sodium content	1.00 0.50 0.08	Very limited Restricted permeability Depth to saturated zone Flooding	1.00 1.00 0.60	Very limited Restricted permeability Flooding Sodium content Salinity	1.00 0.60 0.08 0.01
BfdB: Burford-----	90	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
BfdC: Burford-----	92	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability Too steep for surface application	1.00 0.08
CobB: Cobb-----	75	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Filtering capacity	1.00 0.01
CVRD: Cottonwood-----	42	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 0.08
Vinson-----	25	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 0.96
Rock outcrop-----	23	Not rated		Not rated		Not rated	
DAM: Dam-----	100	Not rated		Not rated		Not rated	
DcbB: Decobb-----	87	Very limited Seepage	1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Somewhat limited Filtering capacity	0.01
DeSD: Devol-----	60	Very limited Seepage	1.00	Somewhat limited Restricted permeability Slope	0.31 0.28	Very limited Filtering capacity Too steep for surface application	1.00 0.50

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DeSD: Springer-----	27	Very limited Seepage Too acid	1.00 0.21	Somewhat limited Restricted permeability Slope	0.96 0.12	Very limited Filtering capacity Too steep for surface application Too acid	1.00 0.32 0.21
EatA: Eastall-----	94	Very limited Depth to saturated zone Ponding Too level	1.00 1.00 0.92	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00
EdsB: Eda-----	82	Very limited Seepage	1.00	Not limited		Very limited Filtering capacity	1.00
EdsD: Eda-----	82	Very limited Seepage	1.00	Somewhat limited Slope	0.12	Very limited Filtering capacity Too steep for surface application	1.00 0.32
EdsF: Eda-----	85	Very limited Seepage Too steep for surface application	1.00 1.00	Very limited Slope	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00
FayB: Farry-----	85	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
FraB: Frankirk-----	80	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.21
GdfB: Grandfield-----	80	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GfGB: Grandmore-----	61	Very limited Seepage	1.00	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Somewhat limited Restricted permeability Filtering capacity	0.21 0.01
Grandfield-----	32	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
GlGB: Grandmore-----	65	Very limited Seepage	1.00	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Filtering capacity Restricted permeability	1.00 0.21
Grandfield-----	25	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Filtering capacity	1.00
GlsB: Grandfield-----	84	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Filtering capacity	1.00
GlsD: Grandfield-----	82	Very limited Seepage	1.00	Very limited Restricted permeability Slope	1.00 0.12	Very limited Filtering capacity Too steep for surface application	1.00 0.32
GmuA: Gracemont-----	90	Very limited Flooding Seepage Depth to saturated zone Too level Salinity	1.00 1.00 1.00 0.50 0.13	Very limited Depth to saturated zone Restricted permeability Flooding	1.00 0.61 0.60	Very limited Depth to saturated zone Salinity Flooding	1.00 1.00 0.60
GmwA: Gracemont-----	87	Very limited Flooding Seepage Depth to saturated zone Too level Salinity	1.00 1.00 1.00 0.50 0.13	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.61	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GsEA: Gracemore-----	80	Very limited Flooding Seepage Depth to saturated zone Too level Salinity	1.00 1.00 1.00 0.50 0.13	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.31	Very limited Depth to saturated zone Flooding Salinity Filtering capacity	1.00 1.00 1.00 0.01
Ezell-----	15	Very limited Flooding Seepage Depth to saturated zone Ponding Too level	1.00 1.00 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Ponding Restricted permeability	1.00 1.00 1.00 0.31	Very limited Filtering capacity Depth to saturated zone Flooding Ponding Salinity	1.00 1.00 1.00 1.00 0.01
HdmA: Hardeman-----	88	Very limited Seepage Too level	1.00 0.50	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01
HdmB: Hardeman-----	88	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Filtering capacity	0.01
HdmC: Hardeman-----	90	Very limited Seepage	1.00	Somewhat limited Restricted permeability	0.31	Somewhat limited Too steep for surface application Filtering capacity	0.08 0.01
HdmE: Hardeman-----	90	Very limited Seepage Too steep for surface application	1.00 0.22	Very limited Slope Restricted permeability	1.00 0.31	Very limited Too steep for surface application Too steep for sprinkler application Filtering capacity	1.00 0.22 0.01
HeyB: Heatly-----	72	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Filtering capacity	1.00

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HkfA: Headrick-----	76	Very limited Seepage Depth to saturated zone Too level	1.00 0.86 0.50	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Somewhat limited Depth to saturated zone Restricted permeability Filtering capacity	0.86 0.21 0.01
HksA: Headrick-----	83	Very limited Seepage Depth to saturated zone Too level	1.00 0.86 0.50	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Filtering capacity Depth to saturated zone Restricted permeability	1.00 0.86 0.21
HolA: Hollister-----	91	Somewhat limited Too level Seepage	0.50 0.39	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
HrAC: Harmon-----	50	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 0.02
Aspermont-----	44	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
JesC: Jester-----	87	Very limited Seepage	1.00	Not limited		Very limited Filtering capacity	1.00
JesF: Jester-----	96	Very limited Seepage Too steep for surface application	1.00 1.00	Very limited Slope	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KcRG: Knoco-----	45	Very limited Too steep for surface application	1.00	Very limited Slope Restricted permeability	1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application Restricted permeability	1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
KoBE: Knoco-----	45	Not limited		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Badland-----	30	Not rated		Not rated		Not rated	
LacB: La Casa-----	79	Somewhat limited Seepage	0.69	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.96
LDF: Landfill-----	100	Not rated		Not rated		Not rated	
LnuA: Lincoln-----	90	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Somewhat limited Flooding	0.60	Very limited Filtering capacity Flooding	1.00 0.60
LnWA: Lincoln-----	65	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Somewhat limited Flooding	1.00	Very limited Filtering capacity Flooding	1.00 1.00
Westola-----	25	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Very limited Flooding Restricted permeability	1.00 0.31	Very limited Flooding Filtering capacity	1.00 0.01
M-W: Water-----	100	Not rated		Not rated		Not rated	
MagA: Madge-----	88	Very limited Seepage Too level	1.00 0.18	Very limited Restricted permeability	1.00	Not limited	
MagB: Madge-----	90	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Not limited	

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MngA: Mangum-----	80	Very limited Flooding Too level Seepage	1.00 0.50 0.39	Very limited Restricted permeability Flooding	1.00 0.60	Very limited Restricted permeability Flooding	1.00 0.60
NipA: Nipsum-----	85	Somewhat limited Too level Seepage	0.50 0.04	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.99
NOTCOM: Area not surveyed, access denied-----	100	Not rated		Not rated		Not rated	
OakA: Oakley-----	80	Very limited Seepage Too level	1.00 0.50	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Not limited	
OakB: Oakley-----	85	Very limited Seepage	1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Not limited	
OzkA: Ozark-----	80	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
OzsA: Ozark-----	90	Very limited Seepage Too level Sodium content Depth to saturated zone Salinity	1.00 0.50 0.50 0.46 0.13	Very limited Restricted permeability Depth to saturated zone	1.00 0.47	Very limited Salinity Sodium content Depth to saturated zone Filtering capacity	1.00 0.50 0.46 0.01
PIT: Pits-----	100	Not rated		Not rated		Not rated	
RakA: Roark-----	81	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.96
RKBG: Rock outcrop-----	60	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RKBG: Brico-----	30	Very limited Seepage Too steep for surface application Cobble content	1.00 1.00 1.00	Very limited Slope Restricted permeability Cobble content	1.00 1.00 1.00	Very limited Too steep for surface application Too steep for sprinkler application Cobble content Restricted permeability	1.00 1.00 0.50 0.21
RKO: Rock outcrop-----	100	Not rated		Not rated		Not rated	
RuuA: Rups-----	90	Very limited Flooding Seepage Depth to saturated zone Too level Sodium content	1.00 1.00 0.86 0.50 0.18	Very limited Restricted permeability Depth to saturated zone Flooding	1.00 1.00 0.60	Somewhat limited Depth to saturated zone Flooding Restricted permeability Salinity Sodium content	0.86 0.60 0.54 0.50 0.18
RuwA: Rups-----	82	Very limited Flooding Seepage Depth to saturated zone Too level Sodium content	1.00 1.00 0.86 0.50 0.18	Very limited Flooding Restricted permeability Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Restricted permeability Salinity Sodium content	1.00 0.86 0.54 0.50 0.18
SkCC2: Spikebox-----	50	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 0.61	Very limited Depth to bedrock Too steep for surface application Filtering capacity	1.00 0.08 0.01
Cobb-----	45	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Too steep for surface application Filtering capacity	1.00 0.08 0.01
SpDB: Springer-----	70	Very limited Seepage Too acid	1.00 0.21	Somewhat limited Restricted permeability	0.96	Very limited Filtering capacity Too acid	1.00 0.21

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SpDB: Devol-----	22	Very limited Seepage Too acid	1.00 0.21	Somewhat limited Restricted permeability	0.31	Very limited Filtering capacity Too acid	1.00 0.21
SurA: Spur-----	70	Very limited Seepage Too level Flooding	1.00 0.50 0.40	Very limited Restricted permeability	1.00	Not limited	
SuuA: Spur-----	90	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Very limited Restricted permeability Flooding	1.00 0.60	Somewhat limited Flooding	0.60
SuWA: Spur-----	85	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Very limited Flooding Restricted permeability	1.00 1.00	Very limited Flooding	1.00
TARD: Talpa-----	46	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 0.02
Aspermont-----	37	Very limited Seepage	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Rock outcrop-----	11	Not rated		Not rated		Not rated	
TilA: Tillman-----	85	Somewhat limited Seepage Sodium content Too level	0.69 0.18 0.08	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability Sodium content	0.99 0.18
TilB: Tillman-----	84	Somewhat limited Seepage	0.69	Very limited Restricted permeability	1.00	Somewhat limited Restricted permeability	0.96
TipA: Tipton-----	73	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Not limited	
TlvB: Tilvern-----	78	Somewhat limited Seepage Sodium content	0.69 0.08	Very limited Restricted permeability	1.00	Very limited Restricted permeability Sodium content	1.00 0.08

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TpfA: Tipton-----	90	Very limited Seepage Too level	1.00 0.50	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
TrwB: Treadway-----	87	Not limited		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
UST: Ustorthents-----	100	Not rated		Not rated		Not rated	
VeKE: Vernon-----	40	Somewhat limited Sodium content	0.18	Very limited Restricted permeability	1.00	Very limited Restricted permeability Sodium content Too steep for surface application	1.00 0.18 0.08
Knoco-----	35	Not limited		Very limited Restricted permeability Slope	1.00 0.50	Very limited Restricted permeability Too steep for surface application	1.00 0.68
VerC: Vernon-----	64	Somewhat limited Sodium content	0.18	Very limited Restricted permeability	1.00	Very limited Restricted permeability Sodium content Too steep for surface application	1.00 0.18 0.08
VeTE: Vernon-----	46	Somewhat limited Sodium content	0.18	Very limited Restricted permeability Slope	1.00 0.12	Very limited Restricted permeability Too steep for surface application Sodium content	1.00 0.32 0.18
Talpa-----	25	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Restricted permeability Slope	1.00 1.00 0.12	Very limited Depth to bedrock Too steep for surface application	1.00 0.32
W: Water-----	100	Not rated		Not rated		Not rated	

Soil Survey of Jackson County, Oklahoma

Agricultural Waste Management, Part 2--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WodB: Woods-----	95	Somewhat limited Seepage	0.69	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
WslA: Westola-----	90	Very limited Flooding Seepage Too level	1.00 1.00 0.50	Somewhat limited Flooding Restricted permeability	0.60 0.31	Somewhat limited Flooding Filtering capacity	0.60 0.01
WstA: Westola-----	92	Very limited Seepage Too level Flooding	1.00 0.50 0.40	Very limited Restricted permeability	1.00	Somewhat limited Filtering capacity	0.01
WtlA: Westill-----	85	Somewhat limited Seepage Too level	0.69 0.50	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
WtlB: Westill-----	83	Somewhat limited Seepage	0.69	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

Aspect. The direction in which a slope faces.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

- Backslope.** The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.
- Badland.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.
- Bajada.** A broad alluvial slope extending from the base of a mountain range out into a basin and formed by coalescence of separate alluvial fans.
- Basal area.** The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.
- Basal till.** Compact glacial till deposited beneath the ice.
- Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.
- Base slope.** A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).
- Bedding planes.** Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.
- Bedding system.** A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.
- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Bedrock-controlled topography.** A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.
- Bench terrace.** A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.
- Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.
- Blowout.** A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.
- Bottom land.** The normal flood plain of a stream, subject to flooding.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Breaks.** The steep and very steep broken land at the border of an upland summit that is dissected by ravines.
- Breast height.** An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Butte.** An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

- Cable yarding.** A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Caliche.** A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.
- California bearing ratio (CBR).** The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.
- Canopy.** The leafy crown of trees or shrubs. (See Crown.)
- Canyon.** A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.
- Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
- Catena.** A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.
- Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.
- Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.
- Catsteps.** Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.
- Cement rock.** Shaly limestone used in the manufacture of cement.
- Channery soil material.** Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a chanter.
- Chemical treatment.** Control of unwanted vegetation through the use of chemicals.
- Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.
- Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.
- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Coarse textured soil.** Sand or loamy sand.
- Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
- Cobbly soil material.** Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.
- COLE (coefficient of linear extensibility).** See Linear extensibility.
- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.
- Congeliturbate.** Soil material disturbed by frost action.
- Conglomerate.** A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.
- Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.
- Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.
- Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."
- Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.
- Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.
- Coppice dune.** A small dune of fine grained soil material stabilized around shrubs or small trees.

- Coprogenous earth (sedimentary peat).** Fecal material deposited in water by aquatic organisms.
- Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.
- Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.
- Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.
- Cropping system.** Growing crops according to a planned system of rotation and management practices.
- Cross-slope farming.** Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.
- Crown.** The upper part of a tree or shrub, including the living branches and their foliage.
- Cuesta.** A hill or ridge that has a gentle slope on one side and a steep slope on the other; specifically, an asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.
- Culmination of the mean annual increment (CMAI).** The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.
- Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.
- Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.
- Delta.** A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.
- Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.
- Desert pavement.** On a desert surface, a layer of gravel or larger fragments that was emplaced by upward movement of the underlying sediments or that remains after finer particles have been removed by running water or the wind.
- Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.
- Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.
- Divided-slope farming.** A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.
- Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained*, *somewhat excessively drained*, *well drained*, *moderately well drained*, *somewhat*

poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

- Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.
- Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.
- Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.
- Fine textured soil.** Sandy clay, silty clay, or clay.
- Firebreak.** Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.
- First bottom.** The normal flood plain of a stream, subject to frequent or occasional flooding.
- Flaggy soil material.** Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.
- Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.
- Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
- Fluvial.** Of or pertaining to rivers; produced by river action, as a fluvial plain.
- Foothill.** A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.
- Footslope.** The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).
- Forb.** Any herbaceous plant not a grass or a sedge.
- Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.
- Fragipan.** A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Gilgai.** Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.
- Glacial drift.** Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.
- Glacial outwash.** Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

- Glacial till.** Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.
- Glaciofluvial deposits.** Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.
- Glaciolacustrine deposits.** Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.
- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Graded stripcropping.** Growing crops in strips that grade toward a protected waterway.
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Green manure crop** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground water.** Water filling all the unblocked pores of the material below the water table.
- Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
- Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.
- Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.
- Head out.** To form a flower head.
- Head slope.** A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.
- Hemic soil material (mucky peat).** Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.
- High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.
- Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.
- Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An

explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential.

The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state.

Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net

Soil Survey of Jackson County, Oklahoma

irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Ksat. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Leaching. The removal of soluble material from soil or other material by percolating water.

- Linear extensibility.** Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $\frac{1}{3}$ - or $\frac{1}{10}$ -bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.
- Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.
- Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.
- Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.
- Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.
- Low strength.** The soil is not strong enough to support loads.
- Marl.** An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.
- Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.
- Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.
- Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.
- Mesa.** A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.
- Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.
- Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.
- Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.
- Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.
- Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.
- Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.
- Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.
- Moraine.** An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.
- Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.
- Mottling, soil.** Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size

measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to

100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

- Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.
- Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.
- Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.
- Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.
- Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.
- Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

- Red beds.** Sedimentary strata that are mainly red and are made up largely of sandstone and shale.
- Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.
- Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.
- Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.
- Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.
- Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

- Relief.** The elevations or inequalities of a land surface, considered collectively.
- Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.
- Rill.** A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.
- Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.
- Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.
- Root zone.** The part of the soil that can be penetrated by plant roots.
- Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.
- Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.
- Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.
- Sandstone.** Sedimentary rock containing dominantly sand-sized particles.
- Sapric soil material (muck).** The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.
- Saprolite.** Unconsolidated residual material underlying the soil and grading to hard bedrock below.
- Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.
- Scarification.** The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.
- Second bottom.** The first terrace above the normal flood plain (or first bottom) of a river.
- Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.
- Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)
- Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.
- Shale.** Sedimentary rock formed by the hardening of a clay deposit.
- Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.
- Shoulder.** The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.
- Side slope.** A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.
- Silica.** A combination of silicon and oxygen. The mineral form is called quartz.
- Silica-sesquioxide ratio.** The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils

or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 1 percent
Very gently sloping	1 to 3 percent
Gently sloping	3 to 5 percent
Moderately sloping	5 to 8 percent
Strongly sloping	8 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 45 percent
Very steep	45 percent and higher

Classes for complex slopes are as follows:

Nearly level	0 to 3 percent
Gently undulating	1 to 5 percent
Undulating	1 to 8 percent
Gently rolling	5 to 12 percent
Rolling	5 to 15 percent
Hilly	8 to 30 percent
Steep	20 to 45 percent
Very steep	45 percent and higher

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $\text{Ca}^{++} + \text{Mg}^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

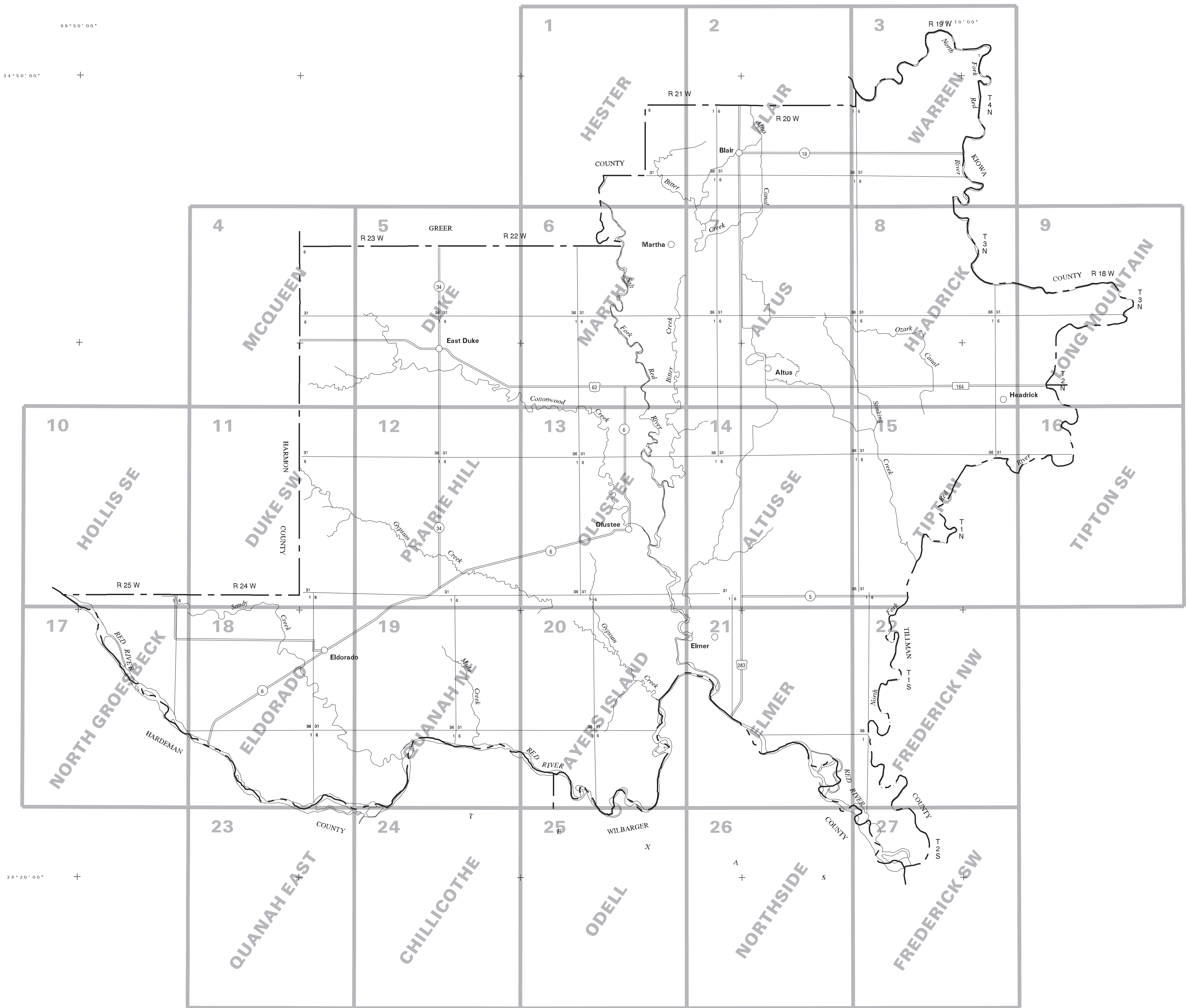
Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

- Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.
- Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.
- Substratum.** The part of the soil below the solum.
- Subsurface layer.** Any surface soil horizon (A, E, AB, or EB) below the surface layer.
- Summer fallow.** The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.
- Summit.** The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.
- Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”
- Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.
- Talus.** Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.
- Terminal moraine.** A belt of thick glacial drift that generally marks the termination of important glacial advances.
- Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.
- Terrace (geologic).** An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.
- Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”
- Till plain.** An extensive area of nearly level to undulating soils underlain by glacial till.
- Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.
- Toeslope.** The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.
- Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.
- Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.
- Tuff.** A compacted deposit that is 50 percent or more volcanic ash and dust.
- Upland.** Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.
- Valley fill.** In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.
- Variegation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

- Varve.** A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.
- Water bars.** Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.
- Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.
- Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.
- Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.
- Windthrow.** The uprooting and tipping over of trees by the wind.

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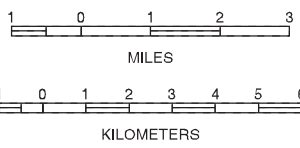
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SECTIONALIZED TOWNSHIP					
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
JACKSON COUNTY,
OKLAHOMA



SCALE = 1:175000

SOIL LEGEND

Map symbols are in alphabetical order. The first letter, always a capital, is the initial letter of the soil series name. The second and third letters are lowercase, unless the unit is an undifferentiated group, a complex, or a miscellaneous area. These letters typically are from the soil series name. The fourth letter, a capital, indicates the slope group. The number 2 at the end of the map symbol indicates that the unit is eroded.

SYMBOL	NAME
Acma	Acme loam, 0 to 1 percent slopes
ArHF	Arnett-Hardeman complex, 3 to 15 percent slopes
ArnB	Arnett sandy loam, 1 to 3 percent slopes
ArnC	Arnett sandy loam, 3 to 5 percent slopes
AsmB	Aspermont silt loam, 1 to 3 percent slopes
AsmC	Aspermont silt loam, 3 to 5 percent slopes
BekA	Beckman silty clay, 0 to 1 percent slopes, occasionally flooded
BfdB	Burford loam, 1 to 3 percent slopes
BfdC	Burford loam, 3 to 5 percent slopes
CobB	Cobb fine sandy loam, 1 to 3 percent slopes
CVRD	Cottonwood-Vinson-Rock outcrop complex, 1 to 8 percent slopes
DAM	Dams
DcbB	Decobb very fine sandy loam, 1 to 3 percent slopes
DeSD	Devol and Springer loamy sands, 3 to 8 percent slopes
EatA	Eastall silty clay, 0 to 1 percent slopes
EdsB	Eda sand, 0 to 3 percent slopes
EdsD	Eda sand, 3 to 8 percent slopes
EdsF	Eda sand, 8 to 15 percent slopes
FayB	Farry fine sandy loam, 1 to 3 percent slopes
FraB	Frankirk loam, 1 to 3 percent slopes
GdfB	Grandfield fine sandy loam, 1 to 3 percent slopes
GfGB	Grandmore and Grandfield fine sandy loams, 1 to 3 percent slopes
GIGB	Grandmore and Grandfield loamy sands, 0 to 3 percent slopes
GlsB	Grandfield loamy sand, 0 to 3 percent slopes
GlsD	Grandfield loamy sand, 3 to 8 percent slopes
GnuA	Gracemont fine sandy loam, saline, 0 to 1 percent slopes, occasionally flooded
GmwA	Gracemont fine sandy loam, saline, 0 to 1 percent slopes, frequently flooded
GsEA	Gracemore and Ezell soils, saline, 0 to 1 percent slopes, frequently flooded
HdmA	Hardeman fine sandy loam, 0 to 1 percent slopes
HdmB	Hardeman fine sandy loam, 1 to 3 percent slopes
HdmC	Hardeman fine sandy loam, 3 to 5 percent slopes
HdmE	Hardeman fine sandy loam, 5 to 12 percent slopes
HeyB	Heatly sand, 0 to 3 percent slopes
HkfA	Headrick fine sandy loam, 0 to 1 percent slopes
HksA	Headrick loamy sand, 0 to 1 percent slopes
HolA	Hollister silty clay loam, 0 to 1 percent slopes
HrAC	Harmon-Aspermont complex, 1 to 5 percent slopes
JesC	Jester fine sand, 1 to 5 percent slopes
JesF	Jester fine sand, 5 to 20 percent slopes
KcRG	Knoco soils and Rock outcrop, 12 to 40 percent slopes
KoBE	Knoco-Badland complex, 1 to 12 percent slopes
LacB	La Casa silty clay loam, 1 to 3 percent slopes
LDF	Landfill
LnuA	Lincoln loamy sand, 0 to 1 percent slopes, occasionally flooded
LnWA	Lincoln and Westola soils, 0 to 1 percent slopes, frequently flooded
M-W	Miscellaneous water
MagA	Madge loam, 0 to 1 percent slopes
MagB	Madge loam, 1 to 3 percent slopes
MngA	Mangum silty clay loam, 0 to 1 percent slopes, occasionally flooded
NipA	Nipsum silty clay loam, 0 to 1 percent slopes
NOTCOM	Area not surveyed, access denied
OakA	Oakley loam, 0 to 1 percent slopes
OakB	Oakley loam, 1 to 3 percent slopes
OzKA	Ozark fine sandy loam, 0 to 1 percent slopes
OzsA	Ozark fine sandy loam, saline, 0 to 1 percent slopes
PIT	Pits
RakA	Roark loam, 0 to 1 percent slopes
RKBG	Rock outcrop-Brico complex, 8 to 50 percent slopes
RKO	Rock outcrop, granite
RuuA	Rups silty clay loam, 0 to 1 percent slopes, occasionally flooded
RuwA	Rups silty clay loam, 0 to 1 percent slopes, frequently flooded
SkCC2	Spikebox-Cobb complex, 3 to 5 percent slopes, eroded
SpDB	Springer and Devol loamy sands, 0 to 3 percent slopes
SurA	Spur clay loam, 0 to 1 percent slopes, rarely flooded
SuuA	Spur clay loam, 0 to 1 percent slopes, occasionally flooded
SuwA	Spur clay loam, 0 to 1 percent slopes, frequently flooded
TARD	Talpa-Aspermont-Rock outcrop complex, 1 to 8 percent slopes
TilA	Tillman clay loam, 0 to 1 percent slopes
TilB	Tillman clay loam, 1 to 3 percent slopes
TipA	Tipton loam, 0 to 1 percent slopes
TivB	Tilvern clay loam, 1 to 3 percent slopes
TpfA	Tipton fine sandy loam, 0 to 1 percent slopes
TrwB	Treadway silty clay loam, 0 to 2 percent slopes
UST	Ustorthents, 5 to 40 percent slopes, very stony
VeKE	Vernon-Knoco complex, 1 to 12 percent slopes
VerC	Vernon clay loam, 3 to 5 percent slopes
VeTE	Vernon-Talpa complex, 1 to 12 percent slopes, stony
W	Water
WodB	Woods clay loam, 1 to 3 percent slopes
WslA	Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded
WstA	Westola fine sandy loam, 0 to 1 percent slopes, rarely flooded
WtlA	Westill clay loam, 0 to 1 percent slopes
WtB	Westill clay loam, 1 to 3 percent slopes

CONVENTIONAL AND SPECIAL
SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

National, state, or province	---
County or parish	----
Minor civil division	----
Reservation (national forest or park, state forest or park)	----
Land grant	----
Limit of soil survey (label) and/or denied access area	----
Field sheet matchline and neatline	----
Previously published survey	----

OTHER BOUNDARY

Airport, airfield	+
Cemetery	⊕
City/county park	⊕

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER
(section and land grants)

GEOGRAPHIC COORDINATE TICK

TRANSPORTATION

Divided roads	====
Other roads	----
Trail	----

ROAD EMBLEMS AND DESIGNATIONS

Interstate	173 79 346
Federal	287 410 224
State	52 52 347
County, farm or ranch	1283

RAILROAD

POWER TRANSMISSION LINE

PIPELINE

FENCE

LEVEES

Without road	=====
With road	=====
With railroad	=====
Single side slope	=====

DAMS

Medium or small	W
Prominent hill or peak	⚡
Soil sample site	Ⓢ

MISCELLANEOUS CULTURAL FEATURES

Farmstead, house	■
Church	✙
School	✎
Other religion	Mt Carmel
Located object	Ranger Station
Tank	Petroleum
Lookout tower	⚠
Oil and/or natural gas wells	⚠
Windmill	⚠
Lighthouse	⚠

HYDROGRAPHIC FEATURES

STREAMS

Perennial stream, double line	=====
Perennial stream, single line	=====
Intermittent stream	=====
Drainage end	=====

DRAINAGE AND IRRIGATION

Double-line canal	=====
Perennial drainage and/or irrigation ditch	=====
Intermittent drainage and/or irrigation ditch	=====

SMALL LAKES, PONDS, AND RESERVOIRS

Perennial water	⦿
Miscellaneous water	⦿
Flood pool line	FLOOD POOL LINE

MISCELLANEOUS WATER FEATURES

Spring	⦿
Well, artesian	⦿
Well, irrigation	⦿

SPECIAL SYMBOLS FOR SOIL
SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS

LANDFORM FEATURES

Bedrock escarpment	=====
Other than bedrock escarpment	=====
Short steep slope
Gully	=====
Depression, closed	◆
Sinkhole	◇
Borrow pit	⊠
Gravel pit	⊠
Mine or quarry	⊠
Landfill	⊠

MISCELLANEOUS SURFACE FEATURES

Blowout	⌒
Clay spot	⊠
Gravelly spot	⋯
Lava spot	Λ
Marsh or swamp	⌒
Rock outcrop (includes sandstone and shale)	∨
Saline spot	+
Sandy spot	⋯
Severely eroded spot	≡
Slide or slip	⌒
Sodic spot	⊠
Spoil area	≡
Stony spot	0
Very stony spot	⊠
Wet spot	⌒

AD HOC FEATURES

Shallow spot	⌒
--------------	---



Joins sheet 5,
Duke

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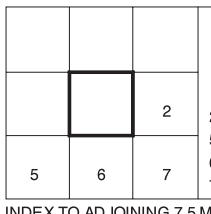
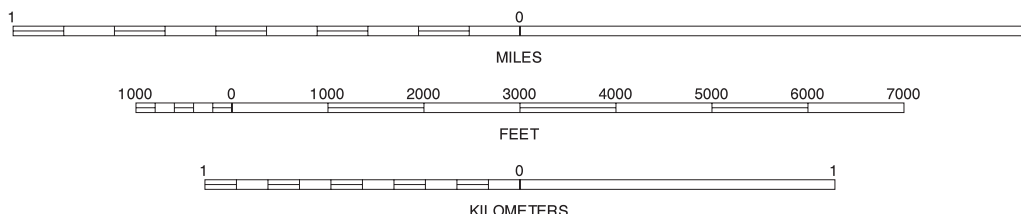
NORTH



QUADRANGLE LOCATION

Joins sheet 6, Martha

SCALE 1:24000



INDEX TO ADJOINING 7.5 MAPS

HESTER, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 27

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 2, Blair

Joins sheet 7,
Altus



Joins sheet 1, Hester

Joins sheet 3, Warren

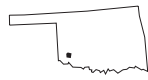
Joins sheet 6, Martha

Joins sheet 8, Headrick

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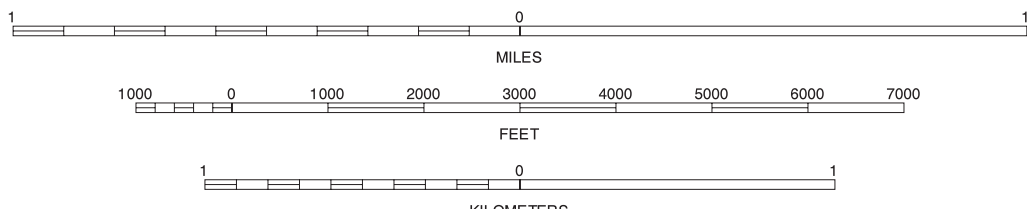
NORTH



QUADRANGLE LOCATION

Joins sheet 7, Altus

SCALE 1:24000



1	3
6	8

INDEX TO ADJOINING 7.5 MAPS

1 HESTER
3 WARREN
6 MARTHA
7 ALTUS
8 HEADRICK

BLAIR, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 27

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Joins sheet 7,
Altus

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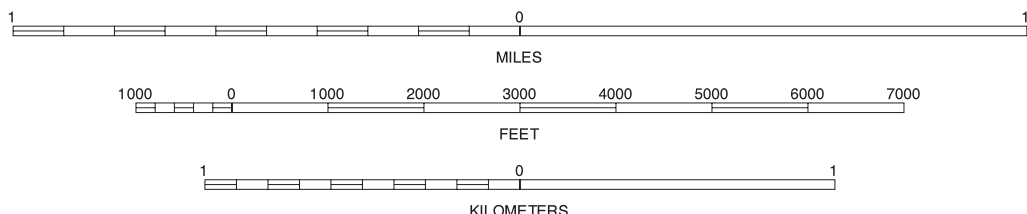
NORTH



QUADRANGLE LOCATION

Joins sheet 8, Headrick

SCALE 1:24000



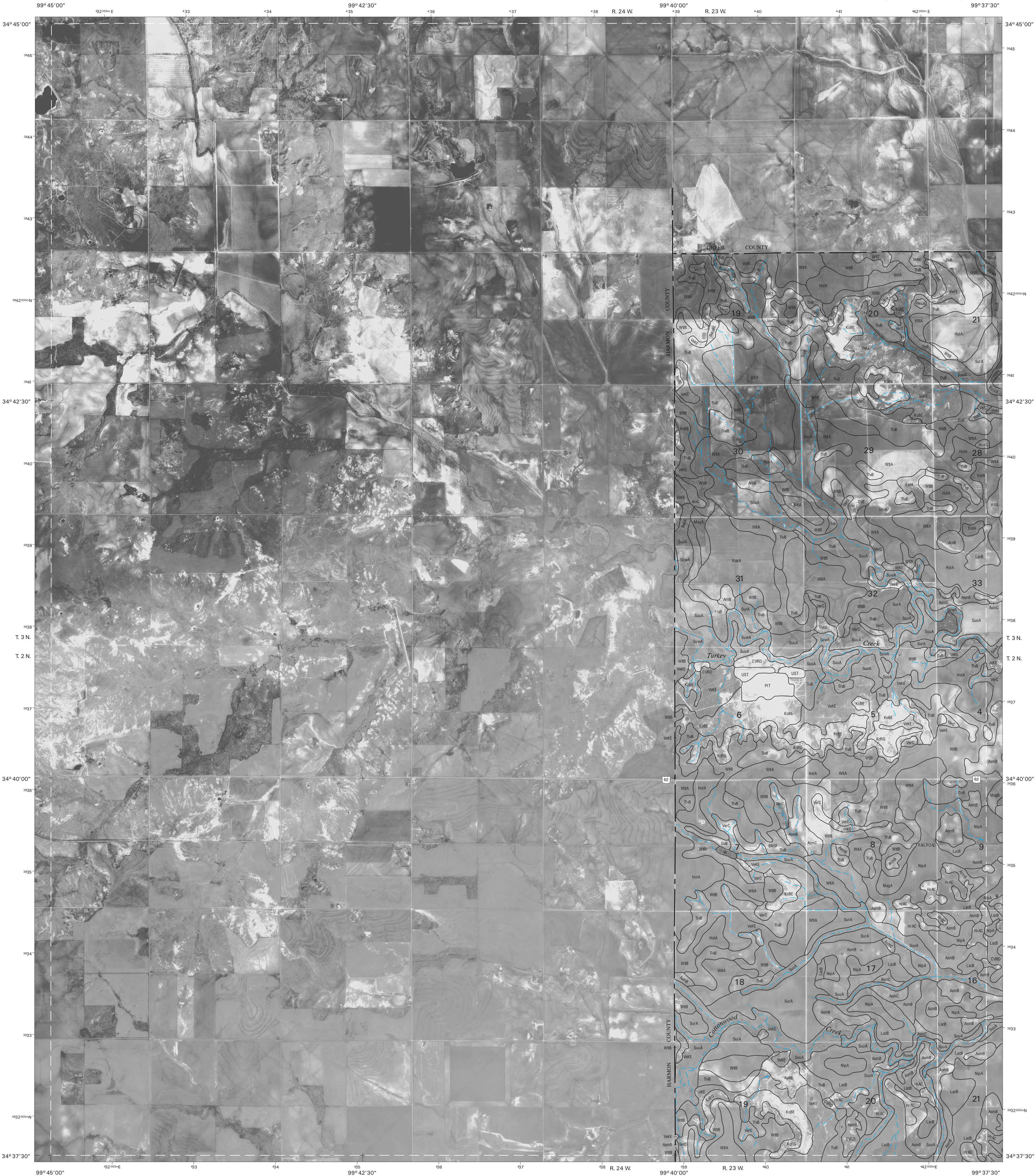
2	BLAIR
7	ALTUS
8	HEADRICK
9	LONG MOUNTAIN

INDEX TO ADJOINING 7.5 MAPS

WARREN, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 3 OF 27

Soil map delineations extending beyond the dashed white quadrangle neeline are for reference only and are included on adjacent map sheets.

Joins sheet 9
Long Mountain



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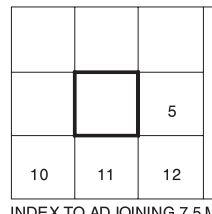
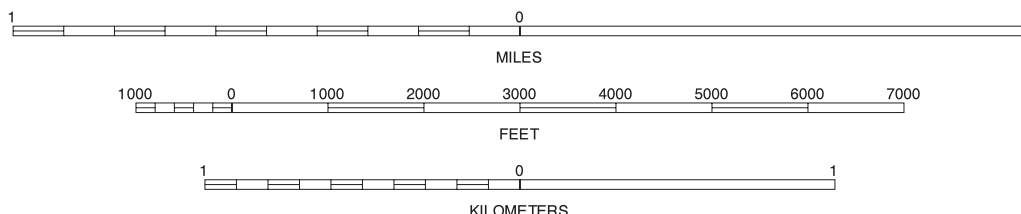
NORTH



QUADRANGLE LOCATION

Joins sheet 11, Duke SW

SCALE 1:24000



MCQUEEN, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 27

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

Joins sheet 5, Duke

Joins sheet 12, Prairie Hill



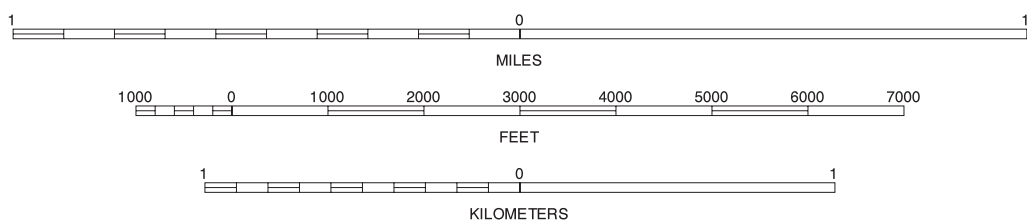
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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



1	HESTER
4	MCQUEEN
6	MARTHA
11	DUKE SW
12	PRAIRIE HILL
13	CLUSTEE

DUKE, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 27

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.



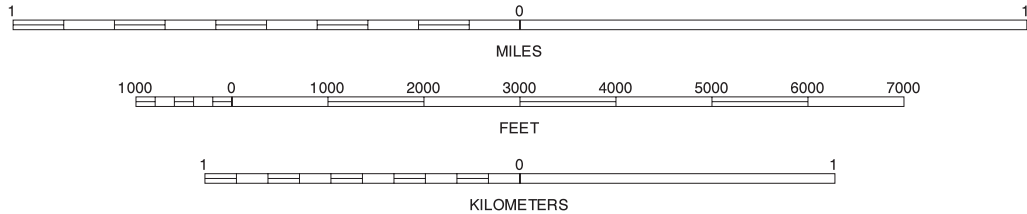
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NORTH



QUADRANGLE LOCATION



1	2
5	7
12	13

1 HESTER
2 BLAIR
5 DUKE
7 ALTUS
12 PRAIRIE HILL
13 OLUSTEE
14 ALTUS SE

MARTHA, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 27

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

Joins sheet 1,
Hester

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JACKSON COUNTY, OKLAHOMA
ALTUS QUADRANGLE
SHEET NUMBER 7 OF 27

Joins sheet 3,
Warren



Joins sheet 13,
Oklahoma

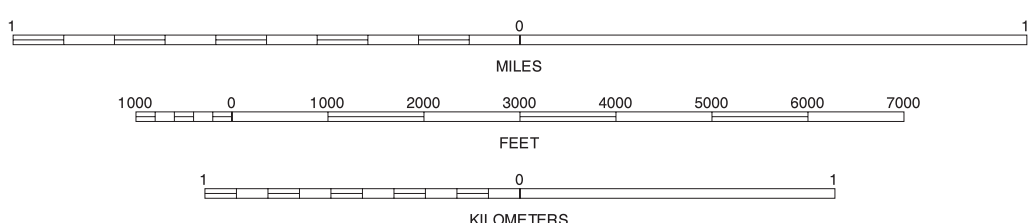
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NORTH



QUADRANGLE LOCATION



Joins sheet 14, Altus SE

SCALE 1:24000

1	2	3
6	8	
13	14	15

1 HESTER
2 BLAIR
3 WARREN
6 MARTHA
8 HEADWICK
13 CLUSTEE
14 ALTUS SE
15 Tipton

INDEX TO ADJOINING 7.5 MAPS

ALTUS, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 27

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

Joins sheet 15,
Tipton

Joins sheet 2,
Blair

UNITED STATES
DEPARTMENT OF AGRICULTURE
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JACKSON COUNTY, OKLAHOMA
HEADRICK QUADRANGLE
SHEET NUMBER 8 OF 27

Joins sheet 3, Warren



Joins sheet 7, Altus

Joins sheet 9, Long Mountain

Joins sheet 14,
Altus SE

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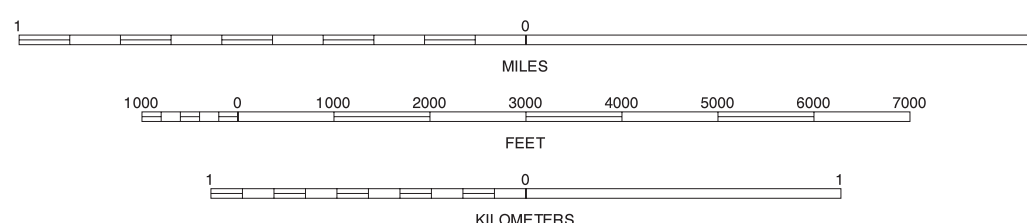
NORTH



QUADRANGLE LOCATION

Joins sheet 15, Tipton

SCALE 1:24000



2	3	2 BLAIR 3 WARREN
7	9	7 ALTUS 9 LONG MOUNTAIN
14	15	14 ALTUS SE 15 TIPTON 16 TIPTON SE

INDEX TO ADJOINING 7.5 MAPS

HEADRICK, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 8 OF 27

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

Joins sheet 16,
Tipton SE

Joins sheet 3,
Warren

UNITED STATES
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JACKSON COUNTY, OKLAHOMA
LONG MOUNTAIN QUADRANGLE
SHEET NUMBER 9 OF 27



Joins sheet 15,
Tipton

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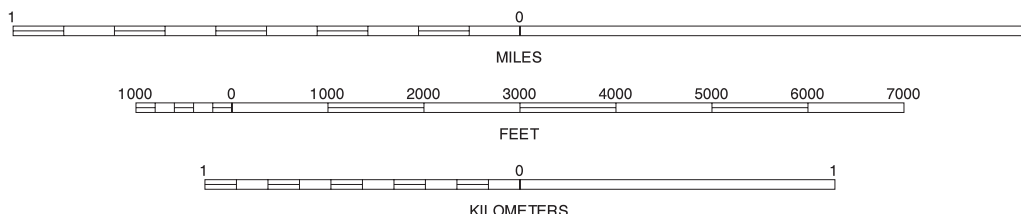
NORTH



QUADRANGLE LOCATION

Joins sheet 16, Tipton SE

SCALE 1:24000



3			3 WARREN
8			8 HEADRICK
			15 TIPTON
15	16		16 TIPTON SE

INDEX TO ADJOINING 7.5 MAPS

LONG MOUNTAIN, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 9 OF 27

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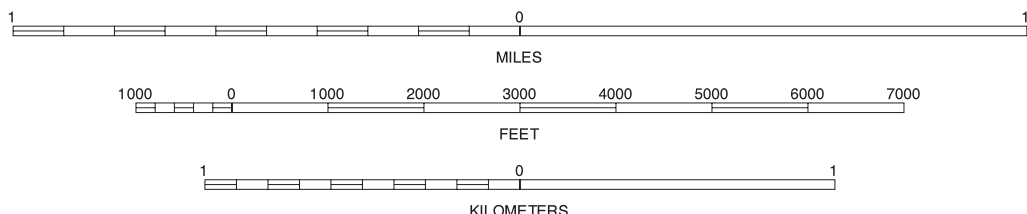
NORTH



QUADRANGLE LOCATION

Joins sheet 17, North Groesbeck

SCALE 1:24000



4	4 MCQUEEN
11	11 DUKE SW
17	17 NORTH GROESBECK
18	18 ELDORADO

INDEX TO ADJOINING 7.5 MAPS

HOLLIS SE, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 10 OF 27

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

JACKSON COUNTY, OKLAHOMA
DUKE SW QUADRANGLE
SHEET NUMBER 11 OF 27
99° 37' 30"

Joins sheet 5,
Duke

Joins sheet 4, McQueen

Joins sheet 12, Prairie Hill

Joins sheet 19
Quarah NE

Joins sheet 10, Hollis SE

Joins sheet 17,
North Groesbeck

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1000-meter ticks: Universal Transverse Mercator, zone 14.
Coordinate grid ticks and land division data, if shown, are
approximately positioned. Digital data are available for
this quadrangle.

NORTH

QUADRANGLE LOCATION

Joins sheet 18, Eldorado

SCALE 1:24000

	4	5	4 MCQUEEN 5 DUKE
10		12	10 HOLLIS SE 12 PRAIRIE HILL 17 NORTH GROESBECK
17	18	19	18 ELDRADO 19 QUANAH NE

DUKE SW, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 11 OF 27

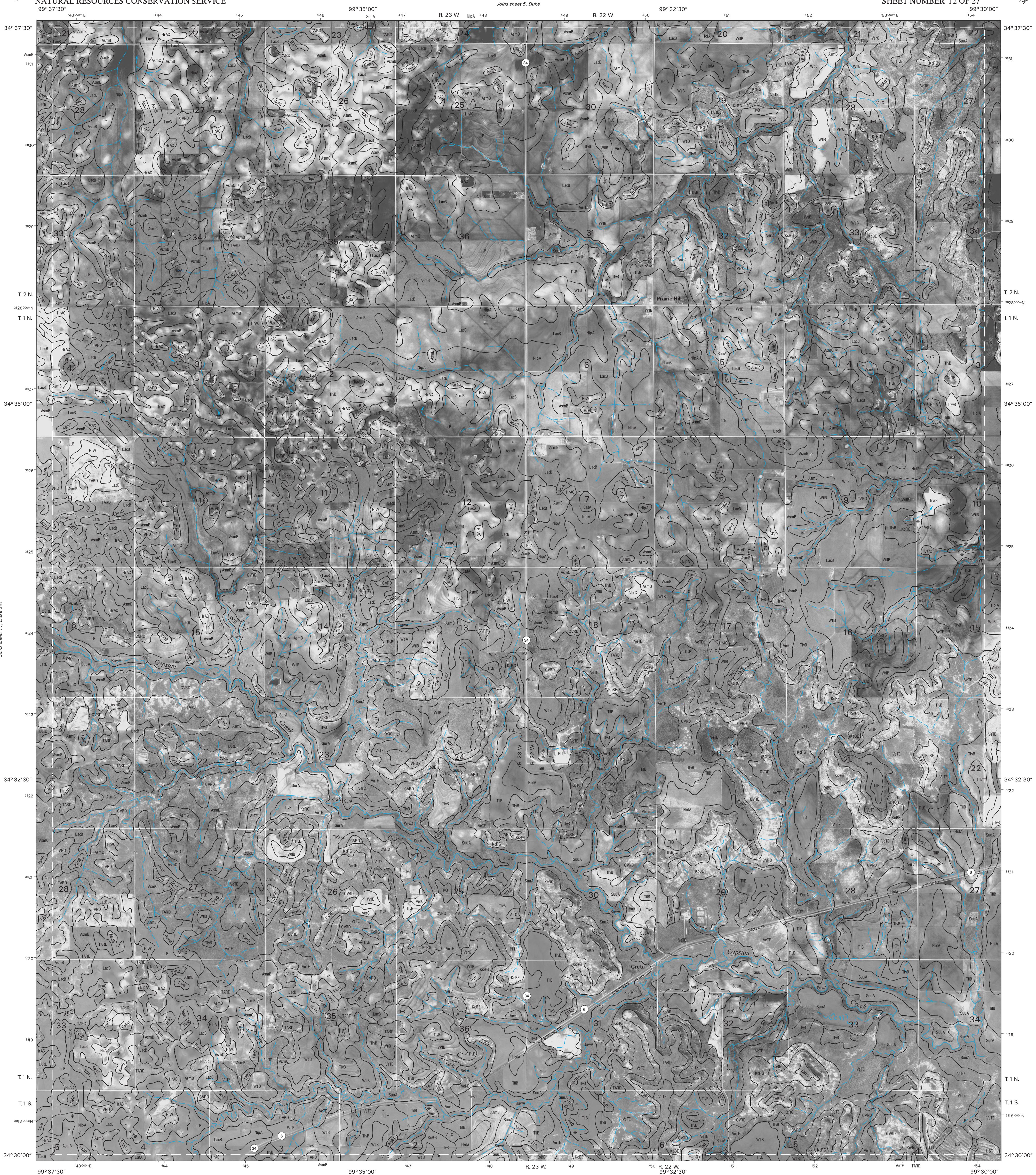
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 4,
McCleary

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JACKSON COUNTY, OKLAHOMA
PRAIRIE HILL QUADRANGLE
SHEET NUMBER 12 OF 27

Joins sheet 6,
Martha



Joins sheet 11, Duke SW

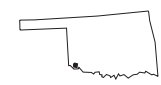
Joins sheet 13, Ousterre

Joins sheet 18,
Eldorado

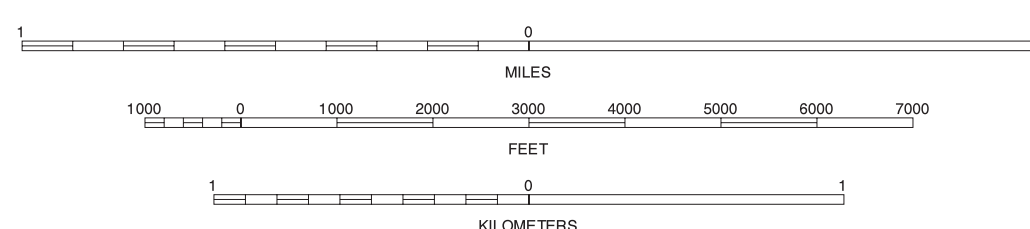
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NORTH



QUADRANGLE LOCATION



SCALE 1:24000

Joins sheet 19, Quannah NE

4	5	6	4 MCQUEEN
			5 DUKE
			6 MARTHA
11		13	11 DUKE SW
			13 OUSTERRE
			18 EL DORADO
18	19	20	19 QUANAH NE
			20 AYERS ISLAND

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PRAIRIE HILL, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 12 OF 27

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

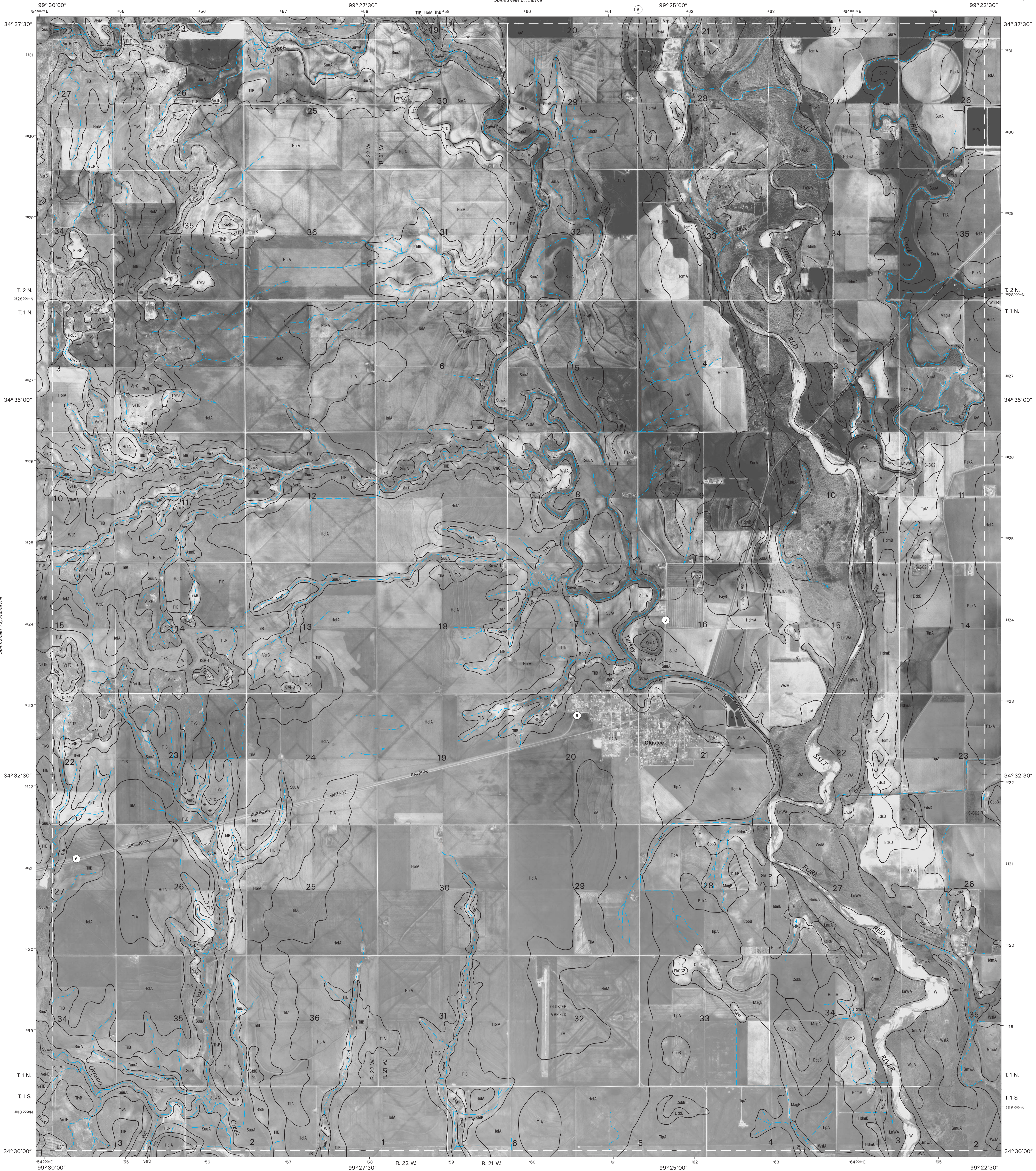
Joins sheet 20,
Ayers Island

Joins sheet 5,
Duke

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JACKSON COUNTY, OKLAHOMA
OLUSTEE QUADRANGLE
SHEET NUMBER 13 OF 27

Joins sheet 7,
Altus



Joins sheet 12, Prairie Hill

Joins sheet 14, Altus SE

Joins sheet 19,
Quinn ME

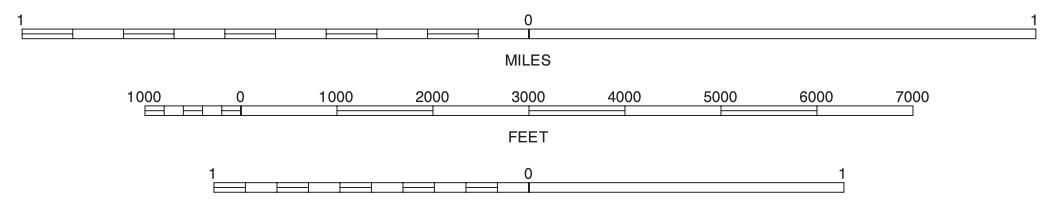
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NORTH



QUADRANGLE LOCATION



SCALE 1:24000

Joins sheet 20, Ayers Island

5	6	7
12	13	14
19	20	21

5 DUKE
6 MARTHA
7 ALTUS
12 PRAIRIE HILL
14 ALTUS SE
19 QUANAH NE
20 AYERS ISLAND
21 ELMER

OLUSTEE, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 13 OF 27

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

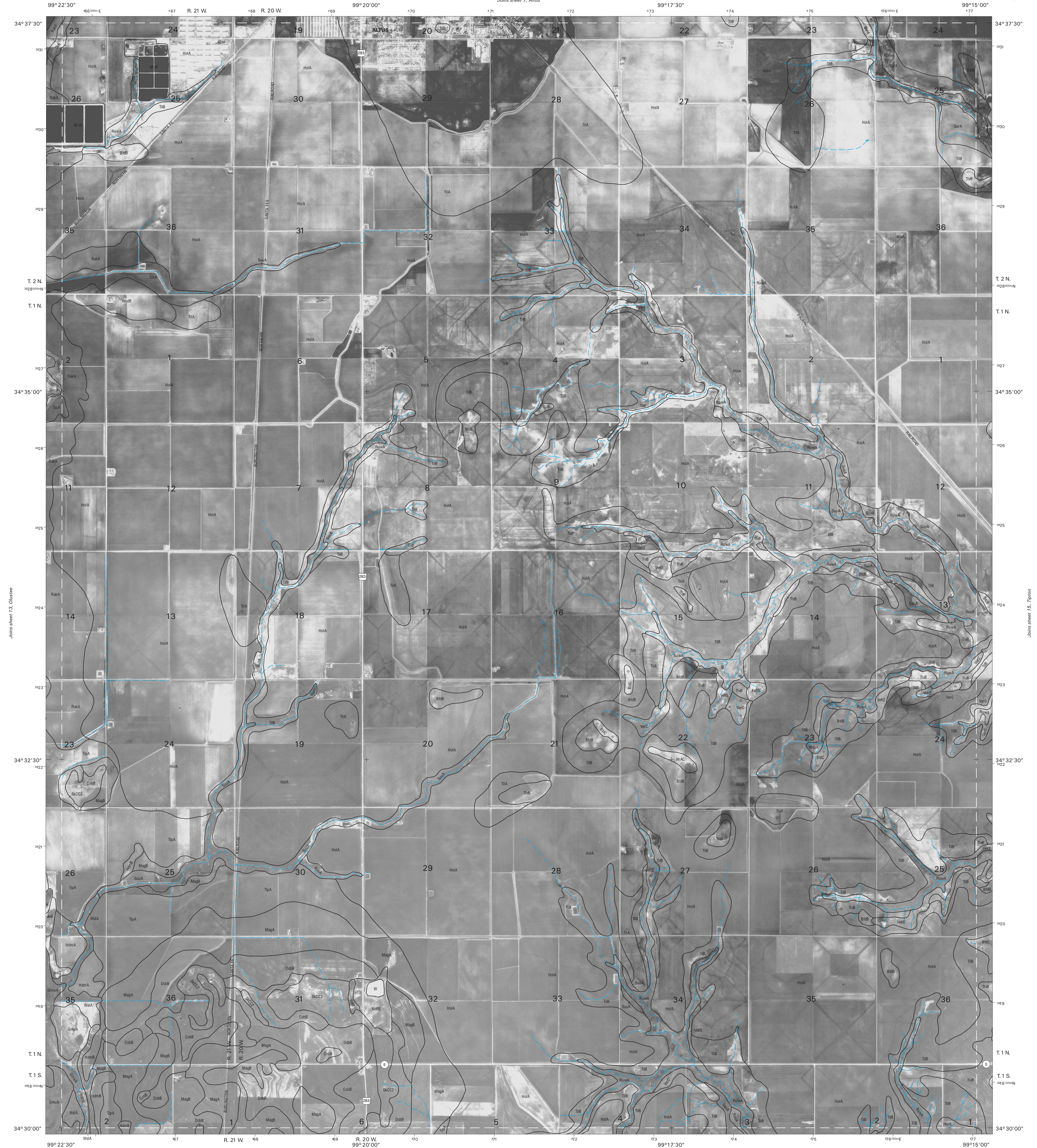
Joins sheet 21,
Elmer

Joins sheet 6,
Hawthorn

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NATURAL RESOURCES CONSERVATION SERVICE

JACKSON COUNTY, OKLAHOMA
ALTUS SE QUADRANGLE
SHEET NUMBER 14 OF 27

Joins sheet 8,
Hawthorn



Joins sheet 20,
Ayers Island

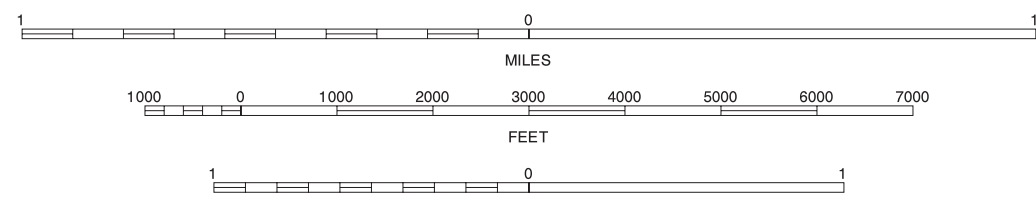
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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



6	7	8
13	14	15
20	21	22

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ALTUS SE, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 14 OF 27

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

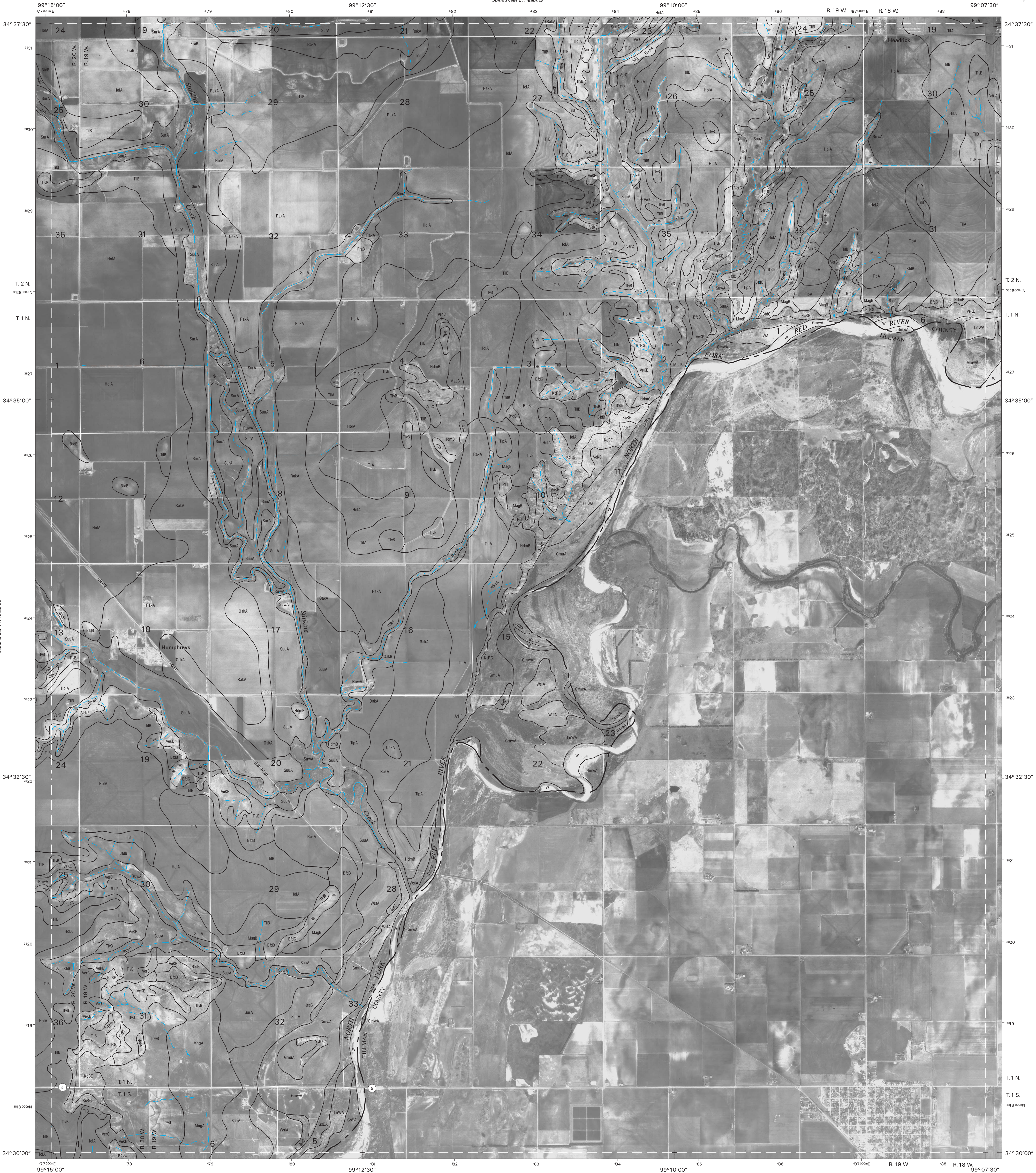
Joins sheet 22,
Frederick NW

Joins sheet 7,
Altus

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NATURAL RESOURCES CONSERVATION SERVICE

JACKSON COUNTY, OKLAHOMA
TIPTON QUADRANGLE
SHEET NUMBER 15 OF 27

Joins sheet 9,
Long Mountain



Joins sheet 14, Altus SE

Joins sheet 16, Tipton SE

Joins sheet 22,
Elmer

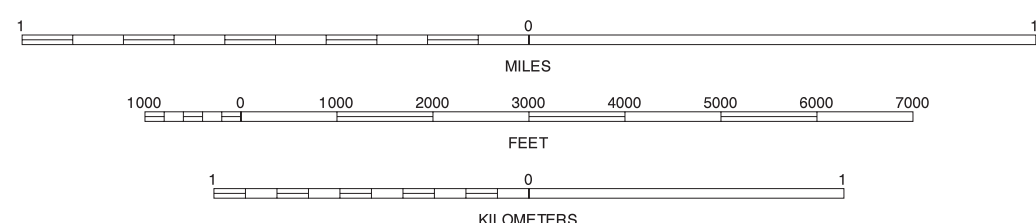
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994-1995 aerial photography. Hydrography information was acquired from the NRCS, Public Land Survey System (PLSS) was acquired from the U.S. Geological Survey and was edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



Joins sheet 22, Frederick NW

SCALE 1:24000

7	8	9
14	15	16
21	22	23

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TIPTON, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 15 OF 27

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 8,
Frederick NW

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JACKSON COUNTY, OKLAHOMA
TIPTON SE QUADRANGLE
SHEET NUMBER 16 OF 27

Joins sheet 9, Long Mountain



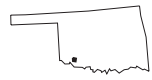
Joins sheet 15, Tipton

Joins sheet 22,
Frederick NW

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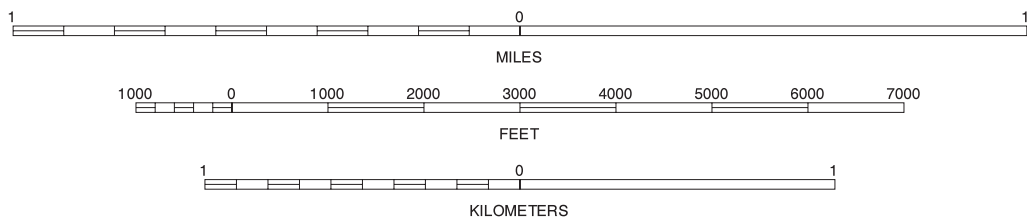
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000

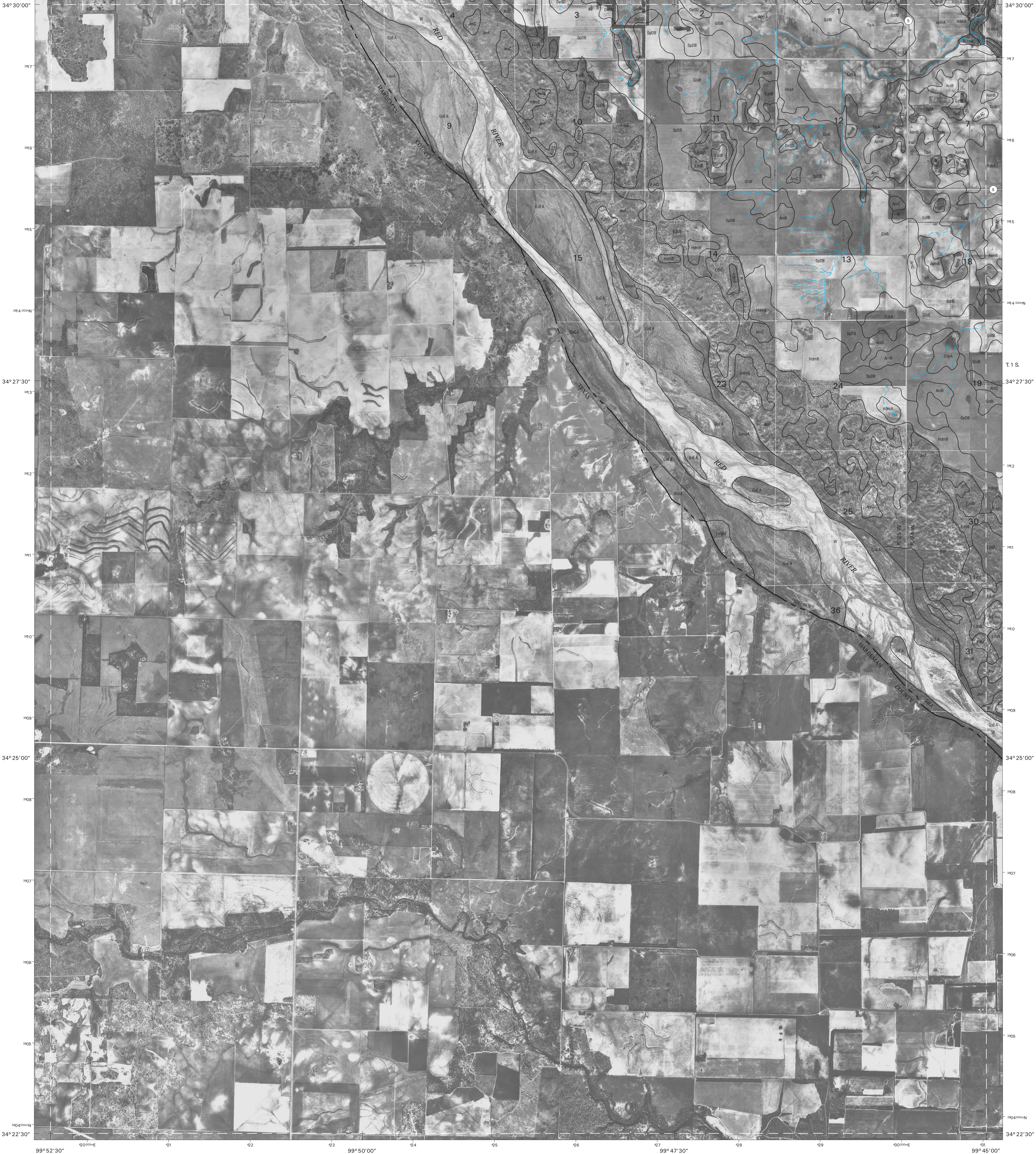


8	9	8 HEADRICK
15	22	15 TIPTON
		22 FREDERICK NW

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TIPTON SE, OKLAHOMA
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SHEET NUMBER 16 OF 27

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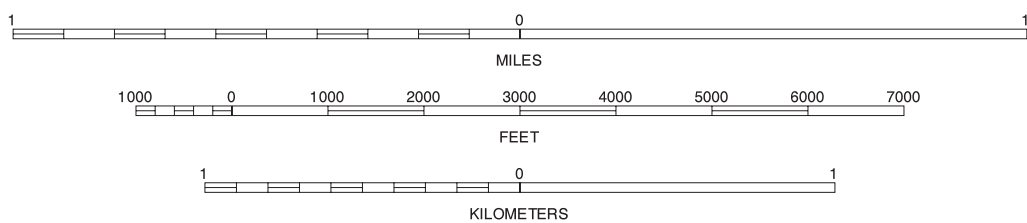
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NORTH



QUADRANGLE LOCATION

SCALE 1:24000



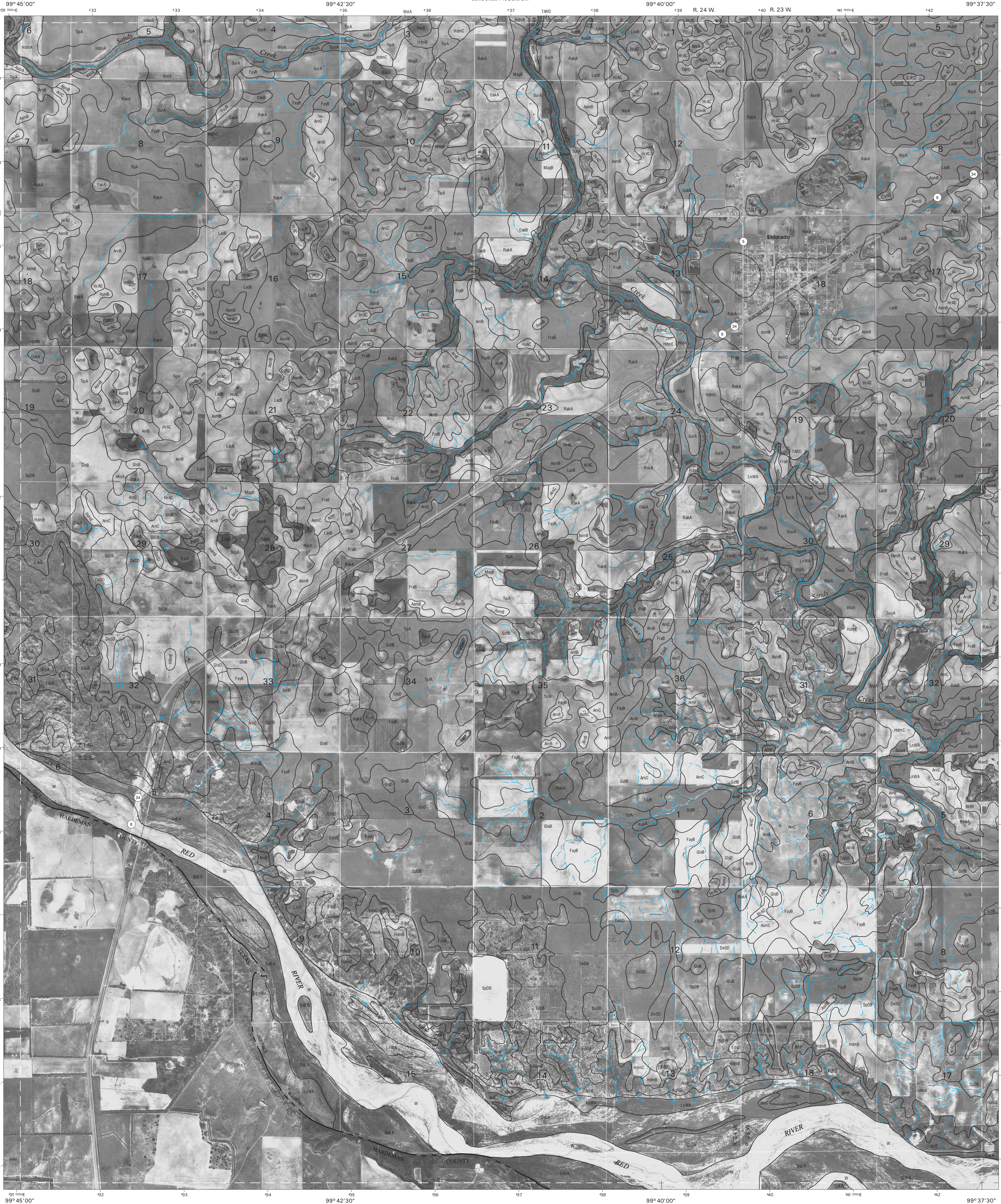
10	11
18	23

10 HOLLIS SE
11 DUKE SW
18 ELDORADO
23 QUANAH EAST

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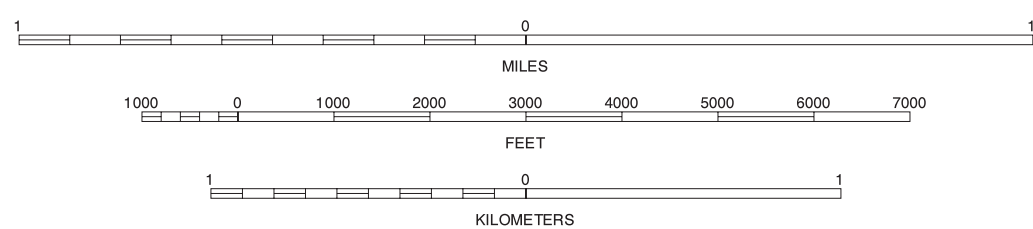
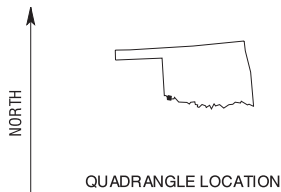
NORTH GROESBECK, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 17 OF 27

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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



10	11	12
17	18	19
23	24	

ELDORADO, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 18 OF 27

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

Joins sheet 11,
Duke Swan

Joins sheet 19,
Quanae



Joins sheet 18, Eldorado

Joins sheet 20, Ayers Island

Joins sheet 22,
Quanae East

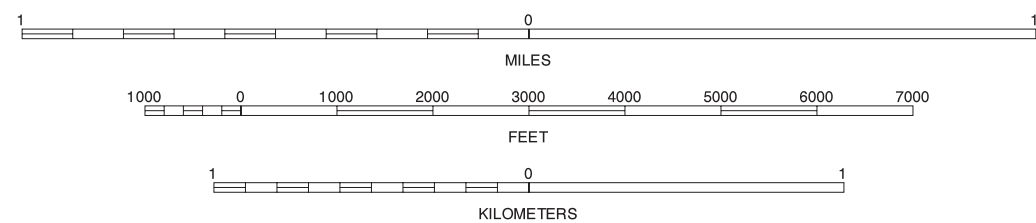
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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



Joins sheet 24, Chillicothe

SCALE 1:24000

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23	24	25

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11 DUKE SW
12 PRAIRIE HILL
13 OLLUSTEE
18 ELDORADO
20 AYERS ISLAND
23 QUANAH EAST
24 CHILICOTHE
25 OCELL

QUANAH NE, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 19 OF 27

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

Joins sheet 25,
Ocell

Joins sheet 12,
Plate right

UNITED STATES
DEPARTMENT OF AGRICULTURE
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JACKSON COUNTY, OKLAHOMA
AYERS ISLAND QUADRANGLE
SHEET NUMBER 20 OF 27

Joins sheet 14,
Anticline



Joins sheet 19, Quannah NE

Joins sheet 21, Elmer

Joins sheet 24,
Cherokee

Joins sheet 26,
Horridale

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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

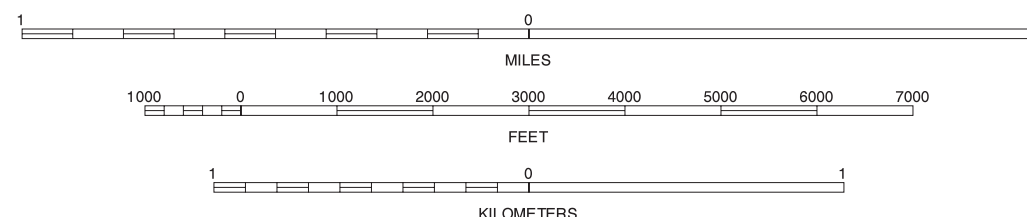
NORTH



QUADRANGLE LOCATION

Joins sheet 25, Odell

SCALE 1:24000



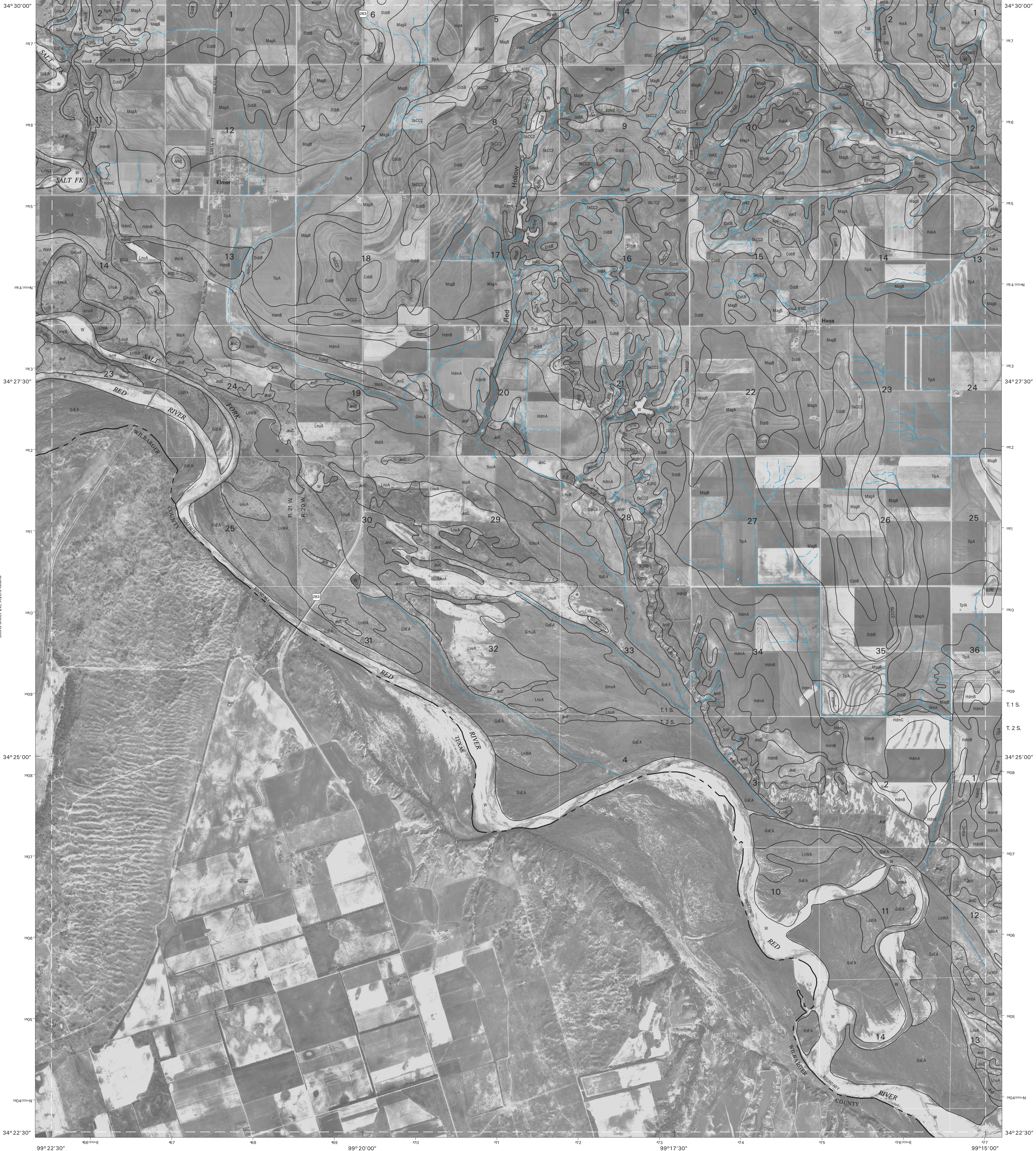
12	13	14
19	20	21
24	25	26

12 PRAIRIE HILL
13 OLUSTEE
14 ALTUS SE
19 QUANAH NE
21 ELMER
24 CHILLICOTHE
25 ODELL
26 NORTHSIDE

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AYERS ISLAND, OKLAHOMA
7.5 MINUTE SERIES
SHEET NUMBER 20 OF 27

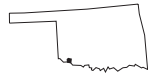
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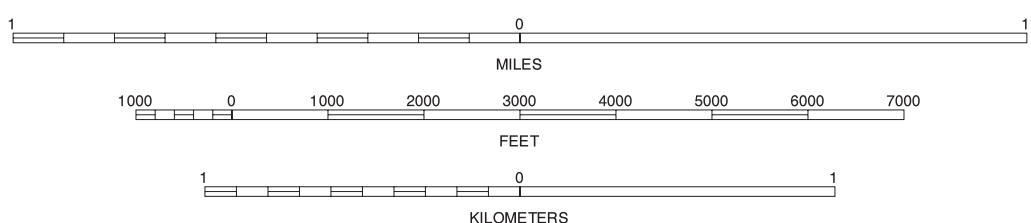
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North American Datum of 1983 (NAD83), GRS-90 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



13	14	15
20	21	22
25	26	27

13 OLUSTEE
14 ALTUS SE
15 TIPTON
20 AYERS ISLAND
21 FREDERICK NW
22 ODELL
25 NORTHSIDE
26 NORTHIDE
27 FREDERICK SW

ELMER, OKLAHOMA
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Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



Joins sheet 26,
Northside

NORTH

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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 12,
North Grosbeck

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DEPARTMENT OF AGRICULTURE
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JACKSON COUNTY, OKLAHOMA
QUANAH EAST QUADRANGLE
SHEET NUMBER 23 OF 27

Joins sheet 19,
Quannah NE



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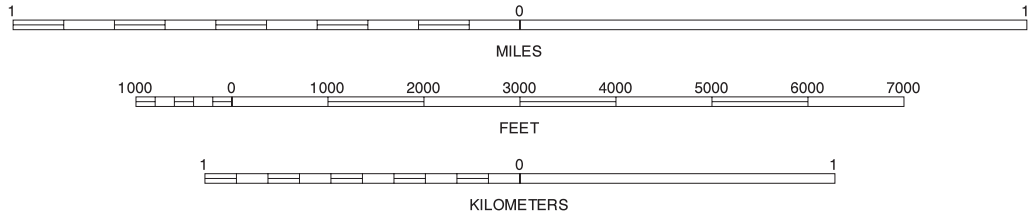
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000



17	18	19	17 NORTH GROESBECK
			18 ELDORADO
			19 QUANAH NE
		24	24 CHILLICOTHE

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QUANAH EAST, OKLAHOMA
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 18,
El Dorado

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JACKSON COUNTY, OKLAHOMA
CHILLICOTHE QUADRANGLE
SHEET NUMBER 24 OF 27

Joins sheet 20,
Ayers Island



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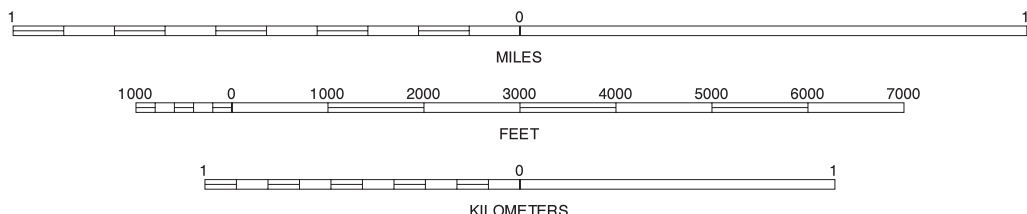
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000



18	19	20	18 EL DORADO
23	24	25	19 QUANAH NE
			20 AYERS ISLAND
			23 QUANAH EAST
			25 ODELL

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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 19,
Chillicothe

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JACKSON COUNTY, OKLAHOMA
ODELL QUADRANGLE
SHEET NUMBER 25 OF 27

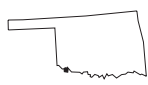
Joins sheet 21,
Elmer



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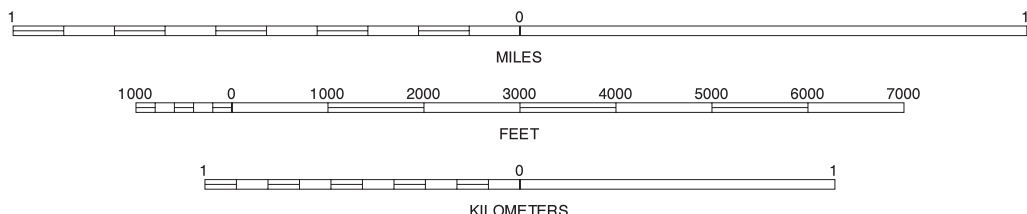
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NORTH



QUADRANGLE LOCATION

SCALE 1:24000



19	20	21	19 QUANAH NE
			20 AYERS ISLAND
			21 ELMER
24		26	24 CHILICOTHE
			26 NORTHSIDE

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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 20,
Ayers Island

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NATURAL RESOURCES CONSERVATION SERVICE

JACKSON COUNTY, OKLAHOMA
NORTHSIDE QUADRANGLE
SHEET NUMBER 26 OF 27

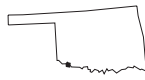
Joins sheet 22,
Frederick NW



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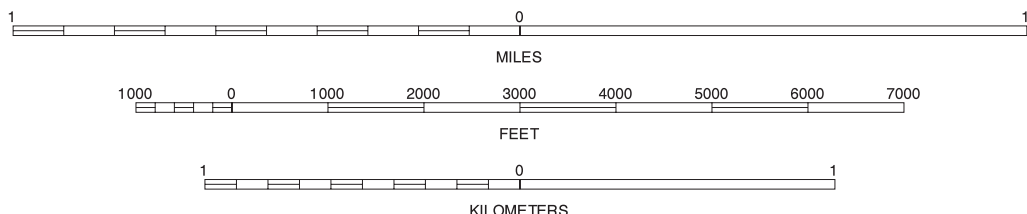
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000



20	21	22	20 AYERS ISLAND 21 ELMER 22 FREDERICK NW 25 ODELL 27 FREDERICK SW
25	26	27	

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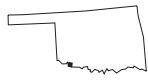
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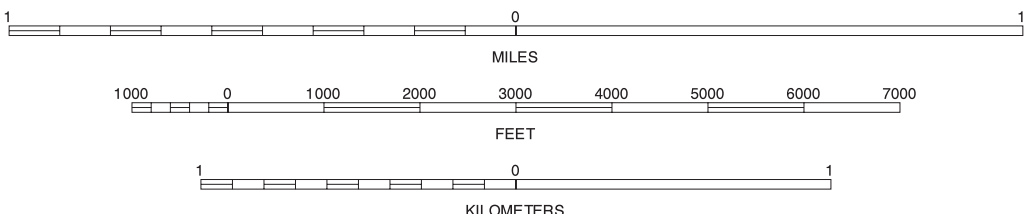
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NORTH



QUADRANGLE LOCATION

SCALE 1:24000



21	22	21 ELMER 22 FREDERICK NW
26		26 NORTHSIDE

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FREDERICK SW, OKLAHOMA
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